

## Memorandum

Food and Drug Administration  
Center for Biologics Evaluation and Research  
Office of Compliance and Biologics Quality  
Division of Manufacturing and Product Quality

**To:** STN 125324/0 (Amendment 3.0) (Pneumococcal 13-valent Conjugate Vaccine (Diphtheria CRM197 Protein) (13vPnC))  
  
Wyeth Pharmaceuticals, Inc. (License #0003)

**From:** Nancy Waites, Reviewer, DMPQ/OCBQ/CBER, HFM-675  
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Nicole Trudel, Reviewer, DMPQ/OCBQ/CBER, HFM-675

**Through:** Carolyn Renshaw, Branch Chief, Manufacturing Review Branch I,  
DMPQ/OCBQ/CBER, HFM-675

**Subject:** DMPQ Review of BLA, received 03 March 2009, for the manufacture of 13vPnC.

**Cc:** Julienne Vaillancourt, Ph.D., Chair, OVRD/DVRPA/CMC1, HFM-481  
Michael Smith, RPM, OVRD/DVRPA/CMC3, HFM- 481

**Recommendation:** We recommend approval of this BLA if the other review offices do not have any issues with it.

### Review Summary and Comments

The purpose of this electronic BLA is for the manufacture of 13vPnC, a second generation pneumococcal conjugate vaccine that will replace Prevnar to expand the vaccine's serotype coverage for the prevention of pneumococcal disease worldwide. The manufacturing occurs in a total of five different facilities – 4 Wyeth facilities and 1 Contract Filling Facility -(b)(4)- Information for all five facilities was reviewed and found to be acceptable. Pre-license inspections were performed at Wyeth Pearl River, -----(b)(4)----- The pre-license inspection at -(b)(4) was waived.

Food and Drug Administration .....	1
Center for Biologics Evaluation and Research .....	1
Office of Compliance and Biologics Quality .....	1
Division of Manufacturing and Product Quality .....	1
<b>General Overview (written by NW) .....</b>	<b>6</b>
<b>Manufacturing Overview .....</b>	<b>7</b>
<b>Supply Strategy .....</b>	<b>7</b>
<b>Initial Commercial Production Plan .....</b>	<b>7</b>
<b>Manufacturing and Testing Sites Addresses and Responsibilities .....</b>	<b>8</b>
<b>Manufacturing Responsibilities for Pneumococcal Polysaccharides .....</b>	<b>8</b>
1 page determined not to be releasable; (b)(4) .....	9
<b>Manufacturing Responsibilities for Pneumococcal Saccharide-CRM<sub>197</sub> Conjugates .....</b>	<b>9</b>
<b>Manufacturing Responsibilities for AlPO<sub>4</sub> –(b)(4)--- and 13vPnC Drug Product .....</b>	<b>10</b>
<b>Process Improvements .....</b>	<b>10</b>
<b>Cell Bank Improvements .....</b>	<b>10</b>
------(b)(4)----- .....	10
------(b)(4)----- .....	11
------(b)(4)----- .....	11
11 pages determined not to be releasable; (b)(4) .....	12
---(b)(4)--- .....	12
<b>Drug Product .....</b>	<b>12</b>
<b>Container Closure .....</b>	<b>12</b>
1 page determined not to be releasable; (b)(4) .....	13
<b>Shipping .....</b>	<b>15</b>
<b>Qualification For Shipping 13vPnC Drug Product Syringes From Pearl River To US Distribution Centers and -(b)(4)- to US Distribution Centers or From –(b)(4)- to Pearl River .....</b>	<b>15</b>
--(b)(4)----- <b>Details (written by MO’L) .....</b>	<b>18</b>
------(b)(4)----- .....	18
8 pages determined not to be releasable; (b)(4) .....	19
------(b)(4)----- .....	20
------(b)(4)----- .....	20
<b>Environmental Monitoring .....</b>	<b>20</b>
--(b)(4)-- HVAC/EM- <i>BLA Section 3.2.1A.1</i> .....	20
10 pages determined not to be releasable; (b)(4) .....	21
<b>Contamination and Cross-Contamination .....</b>	<b>22</b>
<b>Facility/Equipment Cleaning .....</b>	<b>23</b>
2 pages determined not to be releasable; (b)(4) .....	24
<b>Container Closure .....</b>	<b>26</b>
<b>Shipping .....</b>	<b>26</b>
--(b)(4)--- <b>Details (written by NT) .....</b>	<b>27</b>
<b>Drug Substance .....</b>	<b>27</b>
------(b)(4)----- .....	27

----(b)(4)-----	27
1 page determined not to be releasable; (b)(4).....	28
----(b)(4)----- <b>Details (written by NW)</b> .....	29
----(b)(4)----- <b>Facility Overview</b> .....	29
<b>Area Classifications</b> .....	29
<b>Differential Pressure</b> .....	29
<b>Flow Diagrams</b> .....	30
<b>Personnel Flow</b> .....	30
<b>Material Flow</b> .....	30
<b>Equipment Flow</b> .....	30
<b>Waste Flow</b> .....	30
<b>Environmental Qualification and Monitoring</b> .....	30
<b>Environmental Qualifications Overview</b> .....	31
----- (b)(4) -----	31
<b>Contamination and Cross Contamination Controls</b> .....	31
----- (b)(4) -----	32
----- (b)(4) -----	32
----- (b)(4) -----	32
----- (b)(4) -----	32
<b>Utilities</b> .....	32
<b>Water for Injection (WFI)</b> .....	32
<b>Clean Steam</b> .....	33
<b>Compressed Air</b> .....	34
<b>Heating, Ventilation and Air Conditioning (HVAC)</b> .....	35
1 page determined not to be releasable; (b)(4).....	36
<b>Equipment and Cleaning</b> .....	37
<b>Description of Critical Equipment</b> .....	37
----(b)(4)----- .....	38
6 pages determined not to be releasable; (b)(4) .....	39
---(b)(4)--- .....	40
----- (b)(4) -----	40
----- (b)(4) -----	40
----- (b)(4) -----	40
<b>Equipment Cleaning</b> .....	40
<b>Overview of Equipment Cleaning Validation</b> .....	40
2 pages determined not to be releasable; (b)(4) .....	42
<b>Pearl River Details (written by NW)</b> .....	43
<b>Overview of Pearl River Facilities</b> .....	43
<b>Building (b)(4) Description</b> .....	43
<b>Building ---(b)(4)---</b> .....	43
<b>Building (b)(4) – Flows</b> .....	44
----(b)(4)----- .....	44
<b>Material Flows</b> .....	44
<b>Equipment Flows</b> .....	44
<b>Waste Flow</b> .....	44
<b>Building (b)(4) – Utilities</b> .....	45

Heating, Ventilation and Air Conditioning .....	45
Clean Steam .....	50
Compressed Air .....	52
Validation of the Processed Compressed Air System .....	52
Monitoring of the Processed Compressed Air System .....	54
Water for Injection .....	54
<b>Contamination and Cross Contamination Controls.....</b>	<b>56</b>
Contamination Controls .....	56
Cross Contamination Controls .....	56
----- (b)(4) ----- .....	57
----- (b)(4) ----- .....	57
----- (b)(4) ----- .....	57
----- (b)(4) ----- .....	57
7 pages determined not to be releasable; (b)(4) .....	58
<b>Equipment Cleaning Procedures and Cleaning Validation.....</b>	<b>59</b>
Document # 476-0128-VS-04D Cleaning Validation Summary Report .....	61
11 pages determined not to be releasable; (b)(4) .....	62
Routine Cleaning Monitoring .....	63
<b>Overview of Pearl River Facility Building (b)(4) .....</b>	<b>64</b>
----- (b)(4) ----- .....	64
Building --- (b)(4) --- Floor Aluminum Phosphate and 13vPnC Bulk Formulation .....	65
<b>Environmental Qualification and Monitoring .....</b>	<b>66</b>
<b>Environmental Qualifications.....</b>	<b>66</b>
Routine Environmental Monitoring .....	67
<b>Flows.....</b>	<b>68</b>
Flows for Component Preparation Area .....	68
Flows for Aluminum Phosphate and Formulated Bulk Vaccine Manufacturing .....	68
<b>Contamination and Cross-Contamination Controls – Building 215.....</b>	<b>69</b>
Contamination Controls .....	69
Cross-Contamination Controls .....	69
----- (b)(4) ----- .....	69
<b>Building (b)(4) Utilities .....</b>	<b>70</b>
Clean Steam .....	70
1 page determined not to be releasable; (b)(4) .....	72
Process Compressed Air .....	73
<b>Heating, Ventilation and Air Conditioning .....</b>	<b>75</b>
HVAC Qualification .....	76
----- (b)(4) ----- .....	77
<b>Water for Injection System .....</b>	<b>78</b>
----- (b)(4) ----- .....	78
Routine Monitoring of the WFI System .....	80
<b>Equipment and Cleaning .....</b>	<b>80</b>
Critical Process Equipment – Building (b)(4) .....	80
1 page determined not to be releasable; (b)(4) .....	82

1 page determined not to be releasable; (b)(4).....	86
<b>Equipment Cleaning Validation .....</b>	<b>87</b>
<b>Cleaning Validation .....</b>	87
3 pages determined not to be releasable; (b)(4).....	89
<b>Overview of Pearl River Facilities – Building (b)(4).....</b>	<b>90</b>
<b>Building (b)(4) Complex .....</b>	<b>90</b>
<b>Building ---(b)(4)--- Floor Component Preparation Area .....</b>	90
------(b)(4)----- .....	90
<b>Flows.....</b>	<b>91</b>
<b>Building –(b)(4)-- Floor Component Preparation Area .....</b>	91
<b>Equipment and Material Flow .....</b>	91
<b>Soiled Equipment/Waste Material Flow .....</b>	91
<b>Building ---(b)(4)--- Floor Syringe Filling Suite .....</b>	<b>91</b>
<b>Personnel Flow .....</b>	91
<b>Component/Material Flow .....</b>	92
<b>Product Flow .....</b>	92
<b>Soiled Equipment/Waste Material Flow .....</b>	92
<b>Contamination and Cross-Contamination Controls.....</b>	92
<b>Contamination Controls .....</b>	<b>92</b>
<b>Cross-contamination Controls .....</b>	<b>92</b>
------(b)(4)----- .....	93
------(b)(4)----- .....	93
------(b)(4)----- .....	93
------(b)(4)----- .....	93
------(b)(4)----- .....	93
<b>Environmental Qualification and Monitoring – Building (b)(4) .....</b>	<b>94</b>
1 page determined not to be releasable; (b)(4).....	95
<b>Building (b)(4) – Utilities.....</b>	<b>96</b>
<b>Water for Injection (WFI) System .....</b>	96
1 page determined not to be releasable; (b)(4).....	97
<b>Clean Steam System.....</b>	98
<b>Heating, Ventilation and Air Conditioning .....</b>	100
1 page determined not to be releasable; (b)(4).....	103
<b>Process Compressed Air .....</b>	104
------(b)(4)----- .....	<b>106</b>
------(b)(4)----- .....	<b>106</b>
9 pages determined not to be releasable; (b)(4).....	107
<b>Autoclaves .....</b>	108
<b>Fill/Finish Product Contact Equipment and Parts Cleaning Validation.....</b>	<b>110</b>
------(b)(4)----- .....	110
------(b)(4)----- .....	110
1 page determined not to be releasable; (b)(4).....	112
<b>Overview of (b)(4) Facilities (written by NW).....</b>	<b>113</b>
---(b)(4)--- .....	<b>113</b>
<b>Area Classifications .....</b>	113
<b>Differential Pressure .....</b>	113

<b>Component Preparation Area .....</b>	<b>113</b>
----- <b>(b)(4)</b> -----	
-----	<b>113</b>
----- <b>(b)(4)</b> -----	
-----	<b>114</b>
<b>Environmental Qualifications and Monitoring.....</b>	<b>114</b>
<b>Environmental Qualifications.....</b>	<b>114</b>
<b>Environmental Monitoring .....</b>	<b>114</b>
2 pages determined not to be releasable; (b)(4) .....	115
---- <b>(b)(4)</b> -- <b>Flows.....</b>	<b>116</b>
<b>Personnel Flow .....</b>	<b>116</b>
<b>Material and Component Flow .....</b>	<b>116</b>
<b>Product Flow .....</b>	<b>116</b>
<b>Waste Flow .....</b>	<b>116</b>
----- <b>(b)(4)</b> -----	<b>116</b>
----- <b>(b)(4)</b> -----	116
9 pages determined not to be releasable; (b)(4) .....	117
<b>Equipment Cleaning Validation .....</b>	<b>119</b>
----- <b>(b)(4)</b> -----	120
<b>Cleaning Validation .....</b>	<b>120</b>
<b>Contamination and Cross-Contamination Controls – (b)(4) .....</b>	<b>122</b>
<b>Contamination Controls .....</b>	<b>123</b>
<b>Cross-Contamination Controls .....</b>	<b>123</b>
---- <b>(b)(4)</b> ----- <b>– Utilities .....</b>	<b>124</b>
<b>Heating Ventilation and Air Conditioning .....</b>	<b>124</b>
<b>HVAC Qualification .....</b>	<b>125</b>
1 page determined not to be releasable; (b)(4) .....	126
<b>Water for Injection System .....</b>	<b>128</b>
---- <b>(b)(4)</b> -----	<b>130</b>
<b>Clean Steam Validation .....</b>	<b>130</b>
<b>Routine Clean Steam Monitoring .....</b>	<b>130</b>
<b>Process Compressed Air System.....</b>	<b>132</b>
<b>Qualification of the Process Compressed Air System .....</b>	<b>132</b>
<b>Routine Process Compressed Air Monitoring .....</b>	<b>133</b>
<b>Process Validation for 13vPnC Syringe Filling at (b)(4).....</b>	<b>134</b>

#### **General Overview (written by NW)**

13vPnC is a second generation pneumococcal conjugate vaccine that will replace Prevnar to expand the vaccine's serotype coverage for the prevention of pneumococcal disease worldwide.

Proprietary Name: Prevnar 13

Generic Name: Pneumococcal saccharide conjugated vaccine adsorbed, 13-valent

Company Name:

Wyeth Pharmaceuticals, Inc.  
401 N. Middletown Road  
Pearl River, NY 10965

Dosage form: Suspension for Injection

Dosage Strength:

Each 0.5 mL dose is formulated to contain approximately:

2.2 µg of saccharide for serotypes 1, 3, 4, 5, 6A, 7F, 9V, 14, 18C, 19A, 19F and 23F

4.4 µg of saccharide for serotype 6B

Each saccharide is conjugated to CRM197 carrier protein.

Route of Administration: Intramuscular Use

Proposed Indication: Active immunization for the prevention of disease caused by *Streptococcus pneumoniae* serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F and 23F (including sepsis, meningitis, bacteremia, pneumonia and acute otitis media) in infants and children from 2 months to 5 years of age.

## **Manufacturing Overview**

### **Supply Strategy**

The manufacture of the 13vPnC vaccine consists of:

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7. -----(b)(4)-----

For commercial manufacturing these activities will be distributed among Wyeth manufacturing facilities in the United States (at --- (b)(4) ----- Pearl River, NY, and --(b)(4)--), and at ----- (b)(4) ----- In addition, Wyeth has contracted with ----- (b)(4) --- ----- for formulation and filling of Drug Product syringes. The commercial manufacturing and supply scheme is depicted in Figure 2-1 of the submission.

### **Initial Commercial Production Plan**

The manufacturing sites for each polysaccharide and subsequent conjugate are summarized in the tables below. Initially, there will be redundant manufacturing capacity for polysaccharide serotypes --(b)(4)--.

**Commercial Polysaccharide Manufacturing Sites**

[(b)(4)]

**Commercial Conjugate Manufacturing Sites**

[(b)(4)]

**Manufacturing and Testing Sites Addresses and Responsibilities**

The names, addresses and responsibilities of each pneumococcal polysaccharide, conjugate and formulation and filling manufacturing sites, as well as contract laboratories are provided in the tables below.

**Manufacturing Responsibilities for Pneumococcal Polysaccharides**

**Name and Address**

**Responsibilities**

[(b)(4)]



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**Manufacturing Responsibilities for Pneumococcal Saccharide-CRM<sub>197</sub> Conjugates**

[(b)(4)]

**Manufacturing Responsibilities for AlPO<sub>4</sub> –(b)(4)--- and 13vPnC Drug Product****Name and Address****Responsibilities**

Wyeth Pharmaceuticals Inc  
401 N. Middletown Rd.  
Pearl River, NY 10965  
United States  
Tel: + 1 (845) 602 5000  
Fax: + 1 (845) 602 7833

[(b)(4)]

**Process Improvements**

All aspects of Prevnar drug substance manufacturing processes were reviewed and, where appropriate, have been modified and improved. Several specific improvements that warrant particular mention have been implemented as part of the 13vPnC program including:

- Cell bank improvements
- Polysaccharides improvements
- Drug substance (conjugate) improvements
- Drug product improvements

**Cell Bank Improvements**

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**Drug Product  
Container Closure**

The syringe container closure system used for the drug product final container is the exact same at -(b)(4)- and Wyeth Pearl River and it is the currently licensed syringe container closure for Prevnar (7v). All raw material specifications and testing are the same.

**Syringe Container Closure System**

The syringe container closure system consists of -----(b)(4)-----  
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The syringes include plastic rigid tip cap overseal (PRTC), plunger rod and backstop.

Safety data for the syringe barrel and rubber formulations are provided within the submission in Section 3.2.P.2. Pharmaceutical Development: Description and Safety of the Syringe Container Closure System.

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#### **Container Closure Integrity Testing**

The container closure is the exact same as the licensed Prevnar (7v) product. Wyeth provided the following documents to show that the 1 mL syringe container closure system retained integrity when exposed to a stressed environment or with a high concentration of -----**(b)(4)**----- organisms. All acceptance criteria set forth in the protocols were met.

- Document SR0708022 Container Closure Integrity Testing – ---**(b)(4)**----- Challenge Summary Report Version 2.0
- Document # SR0708023 Container Closure Integrity Testing –Microbial Challenge Summary Report Version 2.0

-----~~(b)(4)~~-----

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-----~~(b)(4)~~-----

Additional biological reactivity testing was performed to address extractables in the presence of Drug Product vehicle. The composition of Drug Product vehicle is 5 mM succinate in -----~~(b)(4)~~----- with 0.02% polysorbate 80. The ability of the polysorbate 80 to function as an extracting agent necessitated this additional testing. As summarized in Table 2-3, the extractables testing performed met USP testing requirements.

## **Shipping**

### **Qualification For Shipping 13vPnC Drug Product Syringes From Pearl River To US Distribution Centers and ~~(b)(4)~~ to US Distribution Centers or From ~~(b)(4)~~ to Pearl River**

13vPnC syringes are shipped from Pearl River to US Distribution Centers, ~~(b)(4)~~ to US Distribution Centers, or ~~(b)(4)~~ to Pearl River by temperature controlled trailers. The required shipping temperature range for 13vPnC syringes is ---~~(b)(4)~~----- broader than the recommended storage temperature range of 2–8°C.

### **Rationale for the Shipping Temperature Range**

-----~~(b)(4)~~-----

(b)(4)



**I reviewed 3.2.P.3.5 Process Validation and/or Evaluation – Pearl River, SR 06-2109 – Summary Report: Qualification Studies for Shipping Syringes in Temperature-Controlled Trailers to US Distribution Centers and 3.2.P.3.5 Process Validation and/or Evaluation – (b)(4)- SR 06-2109 – Summary Report: Qualification Studies for Shipping Syringes in Temperature-Controlled Trailers to US Distribution Centers and found them to be acceptable. The (b)(4) shipping studies performed with minimum and maximum number of pallets, during ---(b)(4)----- qualify the use of temperature-controlled trailers for shipment of Drug Product syringes. The studies demonstrated that both the measured and mathematically predicted temperatures were within the acceptance criterion of the study protocol, and support the shipping of 13vPnC syringes at the required shipping temperatures of ---(b)(4)--- The results also demonstrated that shipment conditions are properly monitored using -----(b)(4)----- For single-pallet shipments, (b)(4) temperature monitors should be placed on the pallet to protect against monitor failure. I do not have any questions or comments.**

#### **SR 06-2109 Summary Report: Qualification Studies for Shipping Syringes in Temperature Controlled Trailers to US Distribution Centers**

(b)(4) studies were performed with temperature-controlled trailers loaded with a minimum of a ---(b)(4)--- or with a maximum capacity of pallets, -----(b)(4)----- Electronic temperature monitors were placed at appropriate positions --- (b)(4)--- pallet to obtain thermal exposure data during transport. The trailers were set to an appropriate temperature between 2°C and 8°C during loading. The transports were performed for -----(b)(4)--- to support the longest time period for transport within the continental United States. One transport study each was done with minimum and maximum pallet numbers during -----(b)(4)----- shipping seasons. Temperature data from each of the (b)(4) studies was analyzed statistically to measure pallet surface uniformity within the load space.

#### **Results and Discussions**

The results obtained for the (b)(4) trailer shipments are detailed within this summary report in Table 3-1 located within the submission. All monitored temperatures were within the range of -(b)(4) meeting the acceptance criterion of the study. Additionally, the results demonstrate that the interior cargo areas of refrigerated trucks during -----(b)(4)----- shipping conditions are appropriately monitored by the placement of a -----(b)(4)-----

#### **Deviations**

There were two deviations during execution of the qualification studies. The deviations, resolutions and impacts are detailed within the submission in Table 4-1. I reviewed the deviations and found the investigations and closeout of the deviations to be acceptable.

**---(b)(4)----- Details (written by MO'L)**Background

Wyeth states that both the Pearl River and ---(b)(4)--- sites use -----(b)(4)----- for manufacture of the polysaccharides. The review of the bulk polysaccharide production at the Pearl River facility and common processes used between the (b)(4) facilities for polysaccharide serotype bulk production has been covered further down in this memorandum.

This section's review is focused on manufacturing process and equipment validation data provided to support the bulk manufacture of the pneumococcal polysaccharides in the ---(b)(4)----- facility for Prevnar 13™. The bulk manufacture of polysaccharides in Wyeth's -----

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### **Environmental Monitoring**

#### **--(b)(4)-- HVAC/EM- BLA Section 3.2.1A.1**

The controlled polysaccharide bulk manufacturing area in ----- (b)(4) ----- is a contained environment with limited access. The HVAC system of Building (b)(4) maintains additional segregation of the --(b)(4)-- processes by use of (b)(4) --(b)(4) Air Handling Units (AHU) in the HVAC system for Building. The supply air processed by the HVAC units is delivered to the terminal High Efficiency Particulate Air (HEPA) filters in classified areas, which are located in the ceilings of the -----

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### **Contamination and Cross-Contamination**

Suites ----- (b)(4) ----- and in Pearl River have been designed to minimize the potential of product contamination and personnel exposure by using primarily (b)(4) system processes, separate air handling units, pressure differential zones, air locks, gowning rooms, protective clothing and defined pathways for the flow of personnel, equipment, materials and waste. Manufacturing areas are controlled environments appropriate to the operations that take place in a particular area with pressurization, whether negative or positive, maintained in the area. Room finishes are durable, smooth and cleanable. A gowning room or airlock is located at all entry points, segregating Suite --(b)(4)-- in Building (b)(4) from the rest of the (b)(4) Manufacturing Facility (b)(4) Suites --(b)(4)-- are physically segregated from the other manufacturing areas within the same building. Suites --(b)(4)-- segregate personnel and material entry areas to reduce the opportunity for product contamination and provide personnel protection. Separation includes controlled personnel, material and equipment flows, airlocks, and environmental controls (e.g., HVAC), all of which are independent of each other. The facility is capable of manufacturing aseptically-processed drug substances and intermediates. There is no manufacture of products containing penicillin, cephalosporin, live viruses, spore-forming organisms or cytotoxic drugs. Site procedures are established to avoid any potential mix-up or cross-contamination between 13vPnC drug substances.

----- (b)(4) -----  
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----- During routine or preventative maintenance situations, when the inactivation --(b)(4)-- is not operable, alternative inactivation procedures will be utilized to inactivate all waste and materials prior to their exit from Suite (b)(4). These alternative inactivation procedures have been demonstrated to be effective for inactivating ----- (b)(4) ----- SOPs for both the --(b)(4)-- and Pearl River sites describe the flow of personnel, materials, and equipment through the facility during the manufacturing process to prevent contamination and mix-ups between serotypes. Procedures also ensure that appropriate storage conditions are met throughout the manufacturing process. Clean equipment is separated from soiled equipment. Equipment parts and materials are wiped with an

approved disinfectant agent according to site procedures. The production of polysaccharide serotypes is performed on a campaign basis with ----(b)(4)----- dispensed/processed in an area at a time with line clearance, and cleaning of the facility and equipment performed prior to initiating production of the --(b)(4)--- There are no other products manufactured in --(b)(4)-- Building (b)(4) Suite (b)(4). Wyeth only manufactures polysaccharide serotype bulk for Prevnar 13 with the equipment in Suites (b)(4). These procedures are based on Wyeth's formal risk assessment that was performed to evaluate the effectiveness of the containment operations, procedures and controls for Suite (b)(4).

Conclusion: Wyeth has appropriate controls for prevention of contamination during production in Building (b)(4) Suite (b)(4).

### Facility/Equipment Cleaning

Both the Pearl River and (b)(4) equipment used in polysaccharide production are managed with the following approach; dedicated product-contact equipment is labeled, cleaned and/or sterilized prior to use with the next lot of material. All portable equipment is cleaned and/or sterilized in accordance with written procedures between batches of the same product. Examples of items that are routinely sterilized in autoclaves at ---(b)(4)--- ----- include;

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Conclusion: Wyeth's criteria for equipment cleaning and -(b)(4)- follow recommendations for cleaning validation in current FDA guidance.

### Container Closure

Please refer to Container Closure Systems in the Common Details Section of this memorandum. No deficiencies were observed during the pre-license inspection for the integrity of these (b)(4) vessels.

### Shipping

Please refer to Shipping in the Common Details Section of this memorandum. No deficiencies were observed during the pre-license inspection for the integrity of these (b)(4) vessels.

### References

FDA “Guidance for Industry Sterile Drug Products Produced by Aseptic Processing-Current Good Manufacturing Practice” dated November 1994.

FDA “Guidance for Industry Content and Format of Chemistry, Manufacturing and Controls Information and Establishment Description Information for a Vaccine or Related Product” dated January 1999.

FDA “Guidance for Industry Container and Closure System Integrity Testing in Lieu of Sterility Testing as a Component of the Stability Protocol for Sterile Products” dated February 2008.

**--(b)(4)--- Details (written by NT)**  
Drug Substance

The additional facility and equipment information discussed in this section applies to serotypes 3, 4, 6B, 9V, 14, 18C, 19A, and 23F manufactured at the ----(b)(4)----- site.

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**----- (b)(4) ----- Details (written by NW)****----- (b)(4) ----- Facility Overview**

The ----- (b)(4) ----- Wyeth Biotech facility is located at ----- (b)(4) -----  
----- (b)(4) ----- The facility is located on an approximately (b)(4)-acre site approximately 7 miles from ----- (b)(4) ----- The building arrangement on the portion of the site currently developed is illustrated in Drawing 3.2.A.1, ----- (b)(4) ----- Drug Substance - Manufacturing Suite (b)(4) DRW 00/RD/0001: Overall Site Plan located within the submission. A complete description of the facility can be found within the submission in Section 3.2.A.1 Facilities and Equipment, ----- (b)(4) ----- Drug Substance, Manufacturing Suite (b)(4) Facility Overview.

Vaccines Conjugation, Manufacturing Suite (b)(4) located in Manufacturing Suites Building, Building (b)(4), is dedicated to the manufacture of Monovalent Bulk Conjugates (MBCs) for Serotypes 1, 5, 6A, 7F and 19F. The suite is provided with (b)(4) corridor that surrounds the production area and is used for intermediate product, equipment, materials and personnel flow. Running (b)(4) is the Clean Corridor that enables personnel to move between the production rooms. Gown and Degown rooms are provided at the north end of the corridor.

**Area Classifications**

The Manufacturing Suite (b)(4) area classifications are illustrated in the submission in Drawing 3.2.A.1, --- (b)(4) -----, Drug Substance - Manufacturing Suite (b)(4) DRW 03/RD/0008: Pressurization and Classification (b)(4) Floor Suite (b)(4). Environmental monitoring procedures and specifications supporting these area classifications are detailed in the submission in Section 3.2.A.1 ---- (b)(4) ----- Drug Substance - Manufacturing Suite (b)(4) Environmental Qualifications and Monitoring. The containment area includes HEPA filters in the return ductwork at the containment boundary. Exhaust fans for containment areas and hoods are on the emergency power system. Additional discussion of EM takes place further within this review under Environmental Qualifications and Monitoring.

**Differential Pressure**

The integrity of differing environmental standards is maintained by a cascade of airflow from areas of higher classification to areas of lower classification within the manufacturing facility.

The specified differential pressure to be maintained between areas of different classification in this facility is ---- (b)(4) ----- Pressure differentials are also required between some areas of the same classification to ensure airflow from clean to dirty areas. Pressures are maintained by an active pressure control system. Each area is monitored and controlled against a reference header to provide stable control. Temperature in all clean rooms is maintained at ---- (b)(4) ----- during manufacturing operations. Relative humidity is maintained at ---- (b)(4) ----- RH. Differential pressure between rooms and temperature and humidity measurements in return ducts from critical process rooms are continuously monitored and recorded. ----- (b)(4) ----- is monitored in cold rooms.

## Flow Diagrams

Manufacturing Suite (b)(4) segregates personnel and material entry areas to reduce the opportunity for product contamination and provide personnel protection. Details regarding personnel, material, equipment, and waste flows are included in the submission in Section 3.2.A.1 Facilities and Equipment, -----(b)(4)---- Drug Substance, Manufacturing Suite (b)(4) Flows.

**I reviewed the following flow diagrams and found them to be acceptable. I did not have any questions or comments.**

## Personnel Flow

3.2.A.1, ----(b)(4)---- Drug Substance - Manufacturing Suite (b)(4) DRW 03/RD/0001:  
Personnel Flow --(b)(4)-- Floor

3.2.A.1., ----(b)(4)---- Drug Substance - Manufacturing Suite (b)(4) DRW 03/RD/0003:  
Personnel Flow (b)(4) Floor.

## Material Flow

3.2.A.1., , ----(b)(4)--- Drug Substance - Manufacturing Suite (b)(4) DRW 03/RD/0002:  
Material Flow --(b)(4)-- Floor

3.2.A.1., , ----(b)(4)---- Drug Substance - Manufacturing Suite (b)(4) DRW 03/RD/0004:  
Material Flow (b)(4) Floor.

## Equipment Flow

3.2.A.1, , ----(b)(4)--- Drug Substance - Manufacturing Suite (b)(4) DRW 03/RD/0002:  
Material Flow --(b)(4)-- Floor

3.2.A.1., , ----(b)(4)---- Drug Substance - Manufacturing Suite (b)(4) DRW 03/RD/0004:  
Material Flow (b)(4) Floor.

## Waste Flow

3.2.A.1, ----(b)(4)----, Drug Substance - Manufacturing Suite (b)(4) DRW 03/RD/0004: Material Flow (b)(4) Floor.

## Environmental Qualification and Monitoring

All areas within Manufacturing Suite (b)(4) used for the manufacture of pneumococcal polysaccharides -CRM197 conjugates are classified in accordance with the activities that occur within the area and the level of containment and environmental control that is required. Areas are classified per -----(b)(4)-----  
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Classified areas are monitored on a routine basis for viable and non-viable airborne particulates, and viable microorganisms on surfaces. Contact plates are used to monitor the clean room surfaces. A summary of the environmental qualifications is provided within the submission in Section 3.2.A.1, ---(b)(4), Drug Substance - Manufacturing Suite (b)(4), M3-GC-1090, Environmental Qualifications Summary Report.

**I reviewed M3-GC-1090, Environmental Qualifications Summary Report and found it to be acceptable. I did not have any questions or comments.**

**Environmental Qualifications Overview**

The testing evaluated multiple sample sites in the various environments for viable microorganisms (air sampling, settle plates and contact plates) and non-viable particulates -----(b)(4)----- for each classified environment defined in the protocol. The results of the qualifications demonstrated that the classified areas in Manufacturing Suite (b)(4) met the environmental quality requirements defined in the protocol. During qualification, all media used was certified for growth promotion prior to use.

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**Environmental Monitoring Grade (b)(4)**

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**Environmental Monitoring Grade (b)(4)**

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**Contamination and Cross Contamination Controls**

A summary of the controls used to prevent contamination and cross-contamination can be located within the submission in Section 3.2.A.1 Facilities and Equipment, ----(b)(4)-----  
----- Drug Substance, Manufacturing Suite (b)(4) Contamination and Cross Contamination Controls.

**I reviewed this section and found it to be acceptable. I did not have any questions or comments.**

Manufacturing Suite (b)(4) has been designed to minimize the potential of product contamination and personnel exposure using separate air handling units, pressure differential zones, air-locks, gowning rooms and defined pathways for the flow of personnel, equipment, materials and waste.

The facility is capable of manufacturing aseptically-processed drug substances and intermediates. There is no manufacture of products containing penicillin, cephalosporin, live viruses, spore-forming organisms or cytotoxic drugs. Dedicated product contact equipment is labeled appropriately or controlled by a validated Manufacturing Control System (MCS) system. All portable equipment is cleaned in accordance with validated written procedures after each use. Stationary (fixed) equipment and process piping is ----(b)(4)----- using a (b)(4) system (See Section 3.2.A.1 Equipment Cleaning Procedures and Cleaning Validation, ----(b)(4)----- Drug Substance – Manufacturing Suite (b)(4) within the submission and further on in this review for additional information).

To avoid mix-ups or cross contamination between 13vPnC drug substances, -----(b)(4)----- Room clearance procedures provide assurance that no specific materials or documents remain from manufacturing of a previous batch and routine room cleaning is performed as per site cleaning procedures.

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## Utilities

### Water for Injection (WFI)

A description of the water for injection system and qualification of the system can be found in the submission in Section 3.2.A.1 Facilities and Equipment 1 --- (b)(4)-----, Drug Substance, Manufacturing Suite (b)(4) Water System and Section 3.2.A.1, ----(b)(4)-----, Drug Substance - Manufacturing Suite (b)(4) M3-GC-1120: Water for Injection



System Qualification Summary Report. The WFI system is illustrated in Drawing 3.2.A.1, -----(b)(4)-----, Drug Substance - Manufacturing Suite (b)(4), DRW 03/RD/0022: Water System.

**I reviewed the above sections and do not have any questions or comments. The information provided was acceptable.**

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### **Clean Steam**

A description of the clean steam system and qualification of the system can be found in the submission in Section 3.2.A.1 Facilities and Equipment, ---(b)(4)----, Drug Substance, Manufacturing Suite (b)(4), Clean Steam, Section 3.2.A.1, ---(b)(4)----, Drug Substance - Manufacturing Suite (b)(4), M3-GC-1135: Clean Steam Qualification Summary Report. The Clean Steam System is illustrated in the submission in Drawing 3.2.A.1, --- (b)(4)-----, Drug Substance - Manufacturing Suite (b)(4), DRW 03/RD/0022: WFI and Clean Steam System.

**I reviewed the above sections and do not have any questions or comments. The information provided was acceptable.**

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### **Compressed Air**

A description of the compressed air system and qualification of the system can be found in the submission in Section 3.2.A.1 Facilities and Equipment, ----(b)(4)----, Drug Substance, Manufacturing Suite (b)(4), Compressed Air and Section 3.2.A.1, ----(b)(4)----, Drug Substance - Manufacturing Suite (b)(4), M3-GC-1150: Process Compressed Air Qualification Summary Report.

**I reviewed the above sections and do not have any questions or comments. The information provided was acceptable.**

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**Heating, Ventilation and Air Conditioning (HVAC)**

A description of the HVAC system and qualification of the system can be found in the submission in Section 3.2.A.1 Facilities and Equipment, ----- (b)(4) -----, Drug Substance, Manufacturing Suite (b)(4), HVAC and Section 3.2.A.1, ----- (b)(4) -----, Drug Substance – Manufacturing Suite (b)(4) M3-GC-1100: HVAC Validation Summary Report. The Drawing in Section 3.2.A.1, (b)(4) Drug Substance - Manufacturing Suite (b)(4), 03/RD/0008: Pressurization and Classification First Floor illustrates the areas serviced by each AHU.

**I reviewed the above sections and do not have any questions or comments. The information provided was acceptable.**

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## **Equipment and Cleaning**

### **Description of Critical Equipment**

A description of the critical equipment is located within the submission in Section 3.2.A.1 Facilities and Equipment --- (b)(4) ---, Drug Substance, Manufacturing Suite (b)(4), Description of Critical Equipment.

Installation and Operational Qualifications were completed for the Activation equipment as detailed in the submission in Section 3.2.S.2.5 Process Validation and/or Evaluation, Serotypes 1, 5, 6A, 7F, 19F. A Performance Qualification (PQ) is performed for ----- (b)(4) ----- Vessels where --- (b)(4) --- is applied as a good manufacturing practice to control bioburden. Cleaning Validation information for the equipment is provided within the submission in Section 3.2.A.1, --- (b)(4) ---, Drug Substance - Manufacturing Suite (b)(4), M3-GC-1180: Cleaning Validation Summary Report.

Installation and Operational Qualifications were completed on the - (b)(4) - vessels and testing demonstrated the - (b)(4) - vessels meet user requirements as detailed within the submission in Section 3.2.A.1, --- (b)(4) ---, Drug Substance - Manufacturing Suite (b)(4), M3-GC-0975: - (b)(4) - Vessels Qualification Summary Report. A Performance Qualification (PQ) is performed for the Fill Vessels where -- (b)(4) --- is applied as a good manufacturing practice to control bioburden. Details on the performance of the ----- (b)(4) ----- systems can be located within the submission in Section 3.2.S.2.5 Process Validation and/or Evaluation, Serotypes 1, 5, 6A, 7F, 19F. Cleaning Validation information for the equipment is provided within the submission in Section 3.2.A.1, --- (b)(4) ---, Drug Substance - Manufacturing Suite (b)(4), M3-GC-1180: Cleaning Validation Summary Report

**I reviewed the above sections within the submission and found them to be acceptable. The qualification of the Manufacturing Suite (b)(4) Vessels consisted of an IQ, OQ and PQ that were executed to ensure the vessels operate consistently; meeting the requirements outlined in the qualification protocols. Cleaning validation was also performed on the critical equipment and met all required specifications. The results outlined in the documents listed above demonstrate that the Manufacturing Suite (b)(4) Vessels were successfully qualified. I did not have any questions or comments.**

The Table below lists process equipment that supports activation and conjugation production in Manufacturing Suite (b)(4) along with major support equipment.

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## Equipment Cleaning

A description of the Cleaning Validation can be found within the submission in Section 3.2.A.1 Facilities and Equipment -----(b)(4)-----, Drug Substance, Cleaning Validation. The results obtained during the cleaning validation are detailed in M3-GC- 1180 Cleaning Validation Summary Report, -----(b)(4)-----, Manufacturing Suite (b)(4).

**I reviewed the above sections and found them to be acceptable. I do not have any questions or comments.**

## Overview of Equipment Cleaning Validation

The product contact equipment and systems used in the production of the pneumococcal saccharide-CRM197 conjugates in ----(b)(4)----- are dedicated to Monovalent Bulk Conjugate (MBC) manufacturing.

The production equipment and systems are cleaned to prepare the equipment / systems for the subsequent batch. Large and fixed equipment, such as buffer vessels and dilution vessels, are -----(b)(4)-----. Easily removed/easy to breakdown equipment, such



as small equipment parts and hoses may be -----(b)(4)----- . Both (b)(4) and (b)(4) cleaning cycles can be generally broken up into a ----(b)(4)----- or a ----(b)(4)----- ----- rinse. The ----(b)(4)----- cycle generally consists of: -----(b)(4)----- ----- . The (b)(4) rinse cycle generally consists of ----(b)(4)----- rinses (depending on the equipment type). All of the steps mentioned utilize (b)(4) and the cleaning steps use a ----(b)(4)----- solution as a cleaning agent on process equipment and parts.

Cleaning validation monitoring is performed for -----(b)(4)----- ----- in addition to visual inspection of the equipment in order to monitor the cleaning process.

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## **Pearl River Details (written by NW)**

### **Overview of Pearl River Facilities**

The Pearl River facility is located at 401 N. Middletown Rd, Pearl River, NY, 10965. The facility is located on a roughly ----(b)(4)----- containing approximately 50 buildings and building complexes. Within the plant site, there are facilities for manufacturing, packaging, storage and distribution of finished goods, quality control laboratories, and various support functions, such as maintenance, engineering and administration. The building arrangement on the portion of the site currently developed is illustrated within the submission in 3.2.A.1, Pearl River, Drug Substance – Building (b)(4), DRW E-079421: Wyeth Pearl River Site Plan. Common utilities such as potable water, electricity, and sanitary sewage discharge service are supplied to buildings on site. Plant steam, from the on site steam generator, is supplied to buildings as well. Polysaccharide fermentation, clarification and purification occur in Building (b)(4), . There are three buildings that are related to this submission. -----(b)(4)-----  
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### **Building (b)(4) Description**

#### **Building ---(b)(4)--- – -----**

Building (b)(4) is a (b)(4)-story building with pneumococcal polysaccharide production (----- (b)(4) -----) and -----(b)(4)-----  
----- . Utilities [HVAC, WFI, Clean (b)(4), Compressed Air generator] for the building are on the ----(b)(4)----- floors and in Building (b)(4), which is attached to Building (b)(4).

### **Area Classifications**

Table 2-1 located within the submission in Section 3.2.A.1 Pearl River Drug Substance, Facility Overview identifies the rooms in Building (b)(4) that are used for 13vPnC processing, the HVAC system servicing that area, and the room classification. A schematic illustration of Building (b)(4) room classifications is provided within the submission in Section 3.2.A.1, Pearl River, Drug Substance – Building (b)(4), DRW G-079960: Building -(b)(4)-- Floor Area Classifications and a schematic illustration of Building (b)(4) HVAC distribution is provided in 3.2.A.1, Pearl River, Drug Substance – Building (b)(4), DRW G-080216: Bldg -(b)(4)- Floor HVAC Distribution. Environmental monitoring procedures and specifications supporting these area classifications are detailed in 3.2.A.1, Pearl River, Drug Substance – Building (b)(4), Environmental Qualifications and Monitoring and discussed later within this review. The HVAC systems have terminally High Efficiency Particulate Air (HEPA) filtered air supply and return.

**I reviewed the above drawings, tables and sections for the Pearl River Drug substance facility Building (b)(4) and found them to be acceptable. I did not have any questions or comments. The manufacturing processes occur in either ----- (b)(4)-----areas depending on the manufacturing step.**

**Differential Pressures**

Pressure differentials of----- (b)(4)----- are maintained across closed doors between areas of different classifications. The pressure in the room with the more stringent classification maintains the higher pressure with the exception of the containment area, Fermentation, where pressure is lower than adjoining rooms. Temperature in all rooms is maintained at ----- (b)(4)----- during manufacturing operations, except for Dispensing Room (b)(4) which is maintained at ----- (b)(4)----- and the Product Transfer Area (Rooms ----- (b)(4)-----) which is maintained at ----- (b)(4)----- . Relative humidity is maintained between --(b)(4)---. Differential pressure between rooms and temperature and humidity measurements in return ducts from critical process rooms are continuously monitored and recorded. Sufficient air changes per hour are provided to meet the room cleanliness classification.

**Building (b)(4) – Flows**

Building (b)(4) segregates personnel and material entry areas to reduce the opportunity for product contamination and provide personnel protection. Details regarding personnel, material, equipment, and waste flows are located within the submission in Section 3.2.A.1 Facilities and Equipment, Pearl River, Building (b)(4) Flows.

**I reviewed the following flow diagrams and accompanying description of the flow patterns, segregation procedures and gowning procedures and found them to be acceptable. I do not have any questions or comments.**

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**Material Flows**

Section 3.2.A.1, Pearl River, Drug Substance – Building (b)(4), DRW G-079959:  
Building---(b)(4)--- Floor Material/Process Flow.

**Equipment Flows**

Section 3.2.A.1, Pearl River, Drug Substance - Building (b)(4), DRW G-079959:  
Building --- (b)(4) --- Floor Material / Process Flow

**Waste Flow**

Section 3.2.A.1, Pearl River, Drug Substance - Building (b)(4), DRW G-080067:  
Building --- (b)(4) --- Floor Solid Waste Flow

### Building (b)(4) – Utilities

## Heating, Ventilation and Air Conditioning

The Heating, Ventilation, and Air Conditioning (HVAC) system serving the Polysaccharide Production Area in Building (b)(4) consists of (b)(4) Air Handling Units (AHU -----(b)(4)-----). (See Drw G-080216: P&ID HVAC System).

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The AHUs are equipped with components, which include pre-filters, heating coils, cooling coils, supply fan, and humidification system. The supply air processed by the AHUs is delivered to the terminal High Efficiency Particulate Air (HEPA) filters, which -

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### **HVAC Qualification**

The HVAC system servicing the production areas has been qualified. A summary of the qualifications performed is detailed in Section 3.2.A.1, Pearl River, Drug Substance - Building (b)(4), 476-0009-VS-01: HVAC Qualification Summary Report and Section 3.2.A.1, Pearl River, Drug Substance - Building (b)(4), 476-0009-VS-02: Environmental Qualification Summary Report within the submission.

**I reviewed 476-0009-VS-01: HVAC Qualification Summary Report and 476-0009-VS-02: Environmental Qualification Summary Report and found them to be acceptable. I did not have any questions or comments. The qualification demonstrated that the system operates according to design specifications and maintains the facility within the design parameters. The HVAC qualification tests for the system's ability to provide required air changes, pressurization, temperature, and relative humidity in the production areas. The controllers and building management systems (Supervisory Control And Data Acquisition (SCADA)) are qualified. The HVAC systems for the commercial manufacturing areas were designed and qualified for classified environments for temperature -----(b)(4)-----) relative humidity ---(b)(4)----- to maintain differential pressures between rooms, and sufficient air change rate to provide cleanliness. As part of the qualification of the HVAC system, all classified production areas were tested under active and inactive conditions. Rooms were monitored for total particulate levels, airborne viable particulates, surface viable levels, temperature and relative humidity. The HEPA filters are certified ---(b)(4)-----.**

### **HVAC Qualification Summary Report 476-0009-VS-01D**

This document summarizes the Installation and Operational Qualifications for the Heating, Ventilation, and Air Conditioning (HVAC) systems and associated --(b)(4)--- Flow Unit and Biosafety Cabinets serving the Polysaccharide Production Area in building (b)(4).

### **Installation Qualification**

Per Wyeth, Installation Qualification (IQ) for the HVAC System was executed to verify that all utilities, instrumentation, and equipment were installed and documented according to engineering specifications. Critical equipment and associated devices have been inspected and tagged. Critical instruments have been calibrated. Preventive Maintenance programs have been implemented. All drawings have been verified to accurately depict as-built conditions. Verification of utilities, control systems, all applicable system documentation was completed. The IQ reports are listed in Table 3-1 within the summary report located in the submission. All deviations encountered during IQ executions were investigated and satisfactorily addressed. All IQs were successfully completed.

### **Operational Qualification**

Per Wyeth, Operational Qualification (OQ) for the HVAC System was executed to demonstrate that all Classified Environments meet air quality requirements. Tests including air quality, HEPA filter integrity, design requirements, velocities, air changes, calibrations, alarms, and interlocks were satisfactorily completed. All OQ reports are listed in Table 4-1 in the summary located within the submission. Any deviations encountered during OQ executions were investigated and satisfactorily addressed. All OQs were successfully completed.

Per Wyeth, Installation/Operational Qualification (IO) for the HVAC System was successfully executed. All IOs are listed in Table 4-2 in the summary report located within the submission. Any deviations encountered during IO executions were investigated and satisfactorily addressed. All IOs were successfully completed.

### **Performance Qualification**

This summary report for the PQ references Section 3.2.A.1, Pearl River, Drug Substance - Building (b)(4), 476-0009-VS-02: Environmental Qualification Summary Report for the summary report for the execution of the PQ. My review for this summary report is located below.

### **Environmental Qualifications**

All areas within Building (b)(4) used for the manufacturing of pneumococcal polysaccharides are classified in accordance with the activities that occur within the area and the level of containment and environmental control that is required. Areas are classified per -----(b)(4)-----  
-----.

The environmental qualification standard operating procedure involves sampling for -----(b)(4)----- days at rest and in operation. A summary of the qualifications is provided in 3.2.A.1, Pearl River, Drug Substance - Building (b)(4), 476-0009-VS-02: Environmental Qualification Summary Report. The testing evaluated multiple sample sites in the various environments for viable microorganisms (air sampling, settle plates, and contact plates) and non-viable particulates -----(b)(4)----- for each classified environment defined in the protocol. The results of the qualifications demonstrated that the classified areas in Building (b)(4) met the environmental quality requirements defined in the protocol. During qualification, all media used was certified for growth promotion prior to use.

**I reviewed 476-0009-VS-02: Environmental Qualification Summary Report and found it to be acceptable. I did not have any questions or comments. The environmental qualifications of the facility Heating, Ventilation, and Air Conditioning (HVAC) units serving the Pneumococcal Polysaccharide Production Area in Building (b)(4)--- Floor, demonstrated that the HVAC system met established environmental acceptance criteria for controlled spaces. All deviations associated with the qualification activities were investigated appropriately and closed out.**

**Environmental Qualification Summary Report 476-0009-VS-02**

The rooms were tested for ----(b)(4)----- days during at rest conditions and----(b)(4)----- days during in operation conditions to verify their performance in accordance with Wyeth specifications. Rooms were monitored for total particle levels, airborne viable particulate, surface viable levels, temperature and relative humidity. At rest testing was performed following ----(b)(4)----- operation testing. In operation testing was also conducted with all appropriate equipment operating and personnel present to simulate routine production activities. Routine monitoring sites were selected based on the results of the environmental performance qualifications for the Pneumococcal Polysaccharide Production Area, Building (b)(4).

**Performance Qualification (PQ)**

Performance Qualification (PQ) served as the system at rest and in operation performance test for the graded environments. The scope of the environmental PQs included the following verifications: Test Equipment and Instrumentation Verification, Standard Operating Procedure (SOP) Verification, Training Verification, Temperature and Relative Humidity, Total Airborne Particulate Testing, Viable ---(b)(4)---- Airborne Testing and Surface Viable Testing.

**Temperature and Relative Humidity Testing**

Temperature and Relative Humidity were monitored during at rest and in operation conditions while the environmental monitoring was executed. The protocol requirements for each room were -----(b)(4)-----  
-----

**Environmental Monitoring Testing**

Testing was performed in accordance with the procedures identified in the PQ protocol. The results demonstrate that total particulates, air viable, and surface viable levels meet the acceptance criteria during both at rest and in operation conditions. See the tables below for the action levels. See Table 3-4 through Table 3-7 within the submission for the test results.

**Action Levels for Total Particulate Counts**

**[(b)(4)]**



**Action Levels for Air Viables**

[(b)(4)]

**Action Levels for Surface Viables (-(b)(4)-)**

[(b)(4)]

**Deviations**

Wyeth recorded the deviations encountered during the validation within the submission. I reviewed the deviations and they were appropriately investigated and closed out.

**Routine Environmental Monitoring**

Classified areas are monitored on a routine basis for viable and non-viable airborne particulates, and viable microorganisms on surfaces according to the frequencies specified in the tables below. -----(b)(4)---- are used to monitor the clean room surfaces.

Per Wyeth, the frequency of sampling in the tables and the text below are subject to change based on an annual review along with trending of monitoring results obtained in order to continually improve the program.

**Environmental Monitoring in BSCs**

[(b)(4)]

**Environmental Monitoring Grade (b)(4)**

[(b)(4)]

**Environmental Monitoring Grade (b)(4)**

[(b)(4)]

**Environmental Monitoring Grade (b)(4)**

[(b)(4)]

**Clean Steam**

The clean steam system for the commercial manufacturing areas were designed and qualified to meet the criteria specified in -----(b)(4)-----.

The clean steam system serving the clean rooms has been validated and the quality (----- (b)(4)-----) of the clean steam is requalified ---(b)(4)--. The quality is monitored by routine sampling of the clean steam ---(b)(4)----- and tested as per -----(b)(4)----- requirements. For additional information, refer to 3.2.A.1 Facilities and Equipment, Pearl River, Building (b)(4), Clean Steam and **476-0085-VS-01 Clean Steam System Qualification**. The Clean Steam System is illustrated within the submission in Section 3.2.A.1, Pearl River, Drug Substance - Building (b)(4), DRW C-079409: (b)(4) Clean Steam Flow Block Diagram.

**I reviewed 476-0085-VS-01 Clean Steam System Qualification and DRW C-079409: (b)(4) Clean Steam Flow Block Diagram and found them to be acceptable. The Clean Steam system serving Building (b)(4) at Wyeth, Pearl River is installed as designed and specified, operates within the established design parameters, and produces clean steam meeting current ----(b)(4)----- requirements for (b)(4). All deviations associated with the qualification activities have been successfully resolved. The installation, operational, and performance qualifications for the Clean Steam System were satisfactorily completed.**

**476-0085-VS-01 Clean Steam System Qualification Summary Report  
System Description**

The Clean Steam System utilizes --(b)(4)---- water to produce clean steam that meets the ----(b)(4)----- requirements for -----(b)(4)-----.

The Clean Steam System in Building ---(b)(4)--- consists of -----(b)(4)-----.

Clean Steam from the CSG is distributed at a -----(b)(4)----- clean steam distribution header supplies clean steam generated by the CSGs throughout Building ---(b)(4)--- to various points of use for autoclaves, product contact

vessels, equipment and piping for sanitization/sterilization requirements to support manufacturing of Pneumococcal Polysaccharides.

Per Wyeth, an IQ and OQ were performed to provide documented evidence that the clean steam system was installed and operating in accordance with the specifications and the intended use of the system.

**Performance Qualification (PQ)**

The purpose of the Performance Qualification (PQ) was to document the performance of the Clean Steam system in Building ----(b)(4)---- operated in accordance with the specifications listed below.

**Clean Steam ----(b)(4)----- Parameters Qualified**

**[(b)(4)]**

Testing for the Building (b)(4) Clean Steam Distribution System was conducted by sampling each of the sample ports, including the Clean Steam ----(b)(4)--- sampling port. Samples were collected at a frequency as found in each protocol and the ---(b)(4)--- was tested for chemical attributes -----(b)(4)----- and microbiological contents (----- (b)(4)-----).

Testing for -----(b)(4)----- was performed for the Building (b)(4) Clean Steam Distribution System by sampling the -----(b)(4)----- . The protocols that were executed for the qualification of the Clean Steam System are the following:

**Protocol 476-0005-PQ-03**

**Protocol 476-0005-PQ-04**

**Protocol 476-0005-PQ-05**

**Protocol 476-0085-PQ-01**

**Protocol 476-0085-PQ-02**

**Protocol 476-0121-PQ-01**

**Deviations**

Deviations that occurred during sampling and testing of clean steam were evaluated and addressed for their potential impact on the validation study. I reviewed the deviations recorded by Wyeth and agree that they were appropriately investigated and closed out.

**Routine Clean Steam Monitoring**

Clean Steam Quality is monitored by routine --(b)(4)-- sampling of the clean steam --- (b)(4) --- and tested to ---- (b)(4) ----- requirements. Additionally, the clean steam system is tested for ----- (b)(4) -----.

**Compressed Air****Compressed Air System Description**

---- (b)(4) ---- air compressors provide compressed air directed into a common air receiver before it is divided into (b)(4) main subsystems: -----  
-----  
----- (b)(4) -----  
-----  
-----

**Validation of the Processed Compressed Air System**

A summary of the qualifications performed is detailed within the submission in Section 3.2.A.1, Pearl River, Drug Substance - Building (b)(4), 476-0012-VS-01: Process Compressed Air Qualification Summary Report and demonstrates that the system operates according to design specifications. The following test functions have been met for the Process Compressed Air system at Building 9b(4), Pearl River:

1. ----- (b)(4) -----  
-----
2. ----- (b)(4) -----  
-----
3. ----- (b)(4) -----  
-----
4. ----- (b)(4) -----  
-----
5. ----- (b)(4) -----

**I reviewed 3.2.A.1, Pearl River, Drug Substance - Building (b)(4), 476-0012-VS-01: Process Compressed Air Qualification Summary Report and found it to be acceptable. The Process Compressed Air System serving Building --- (b)(4) --- at Wyeth, Pearl River, NY is installed as designed and specified, operates within the established design parameters, and produces compressed air meeting qualification testing requirements. All deviations were successfully resolved. The Installation, Operational, and Performance Qualifications for the Process Compressed Air System have been satisfactorily completed. I do not have any questions or comments**

**476-0012-VS-01 Process Compressed Air Qualification Summary Report  
Installation Qualification (IQ)**

Installation Qualification (IQ) for the Compressed Air System in ---(b)(4)--- was executed to verify that all piping and equipment were installed according to engineering specifications and Wyeth's requirements. The IQ tests included verification of the following items: equipment calibration, electrical specifications, piping specifications, engineering drawings, technical literature, supporting utilities and all applicable system documentation. The results of the IQ demonstrated that the Compressed Air System was designed and installed as specified. All deviations encountered during IQ execution were investigated and successfully resolved with no impact on the system.

**Operational Qualification (OQ)**

Operational Qualification (OQ) for the Compressed Air System in ---(b)(4)--- was executed to demonstrate that the Compressed Air System, including the control system and its components, operates according to specification. Verification of alarms / interlocks / controls / indicators, graphic and screen navigation, password functionality, input error verification, start up / shut down sequences and load / unload tests for the air compressors and air dryers were also completed. The results of the OQ demonstrated that the Compressed Air System including the control system and its components operate as specified. All deviations encountered during OQ execution were investigated and successfully resolved with no impact on the system.

**Performance Qualification (PQ)**

Performance Qualification (PQ) for the Compressed Air System in ---(b)(4)--- was executed to demonstrate that the Compressed Air System performs according to specification.

The table below summarizes the acceptance criteria for each executed PQ protocol. Each sample was tested for (b)(4) days with the results for each sample meeting acceptance criteria.

**Performance Qualification Acceptance Criteria**

**[(b)(4)]**

**Deviations**

Wyeth recorded 9 deviations during the execution of the PQ. All were appropriately investigated and closed out. I agree with Wyeth's assessment that the deviations did not effect the qualification.

## Monitoring of the Processed Compressed Air System

Nine critical use points are sampled and tested at (b)(4) for (b)(4), Viable Particulates and Non-viable Particulates (b)(4). Presence of (b)(4) and Pressure are continuously measured at the compressed air source.

## Water for Injection

The WFI system is illustrated within the submission in Section 3.2.A.1, Pearl River, Drug Substance - Building (b)(4), DRW C-079401: Building (b)(4) WFI Flow Block Diagram. Included in the WFI system are -----(b)(4)-----, with the associated drops points throughout the Polysaccharide Production Area of Building (b)(4) on the WFI -----(b)(4)----- distribution loop.

(b)(4)

(b)(4)

## Validation of the WFI System

The following test functions have been met for the Water Systems:

1. -----(b)(4)-----  
-----.
2. -----(b)(4)-----
3. -----(b)(4)-----
4. -----(b)(4)-----
- 5.

The validation of the WFI system is detailed within the submission in Section 3.2.A.1, Pearl River, Drug Substance – Building (b)(4), 476-0084-VS-01: Water for Injection Qualification Summary Report.

**I reviewed 3.2.A.1, Pearl River, Drug Substance – Building (b)(4), 476-0084-VS-01: Water for Injection Qualification Summary Report and found it to be acceptable. The Water for Injection (WFI) system serving Buildings (b)(4) is installed, and designed as specified, operates within the established design parameters, and produces WFI meeting current -----(b)(4)----- Requirements. The installation, operational, and performance qualifications for the WFI systems have been satisfactorily completed. I do not have any questions or comments.**

**Report No.: 476-0084-VS-01: Water for Injection Qualification Summary Report****Installation Qualification (IQ)**

Installation Qualification (IQ) was executed to verify that the system is purchased and installed as designed and specified. The IQ tests included verification that the WFI system and components were delivered as specified, adequately marked/tagged, accompanied by adequate documentation, and installed correctly according to drawings and specifications. In addition, all critical instruments were confirmed as calibrated and preventive maintenance checklists were confirmed to be in place and maintained.

**Operational Qualification (OQ)**

Operational Qualification (OQ) for the WFI system was executed to demonstrate that the WFI system, including the control system and its components, operates according to specification. The OQ tests included verification of proper operation of the system components, alarms, control loops, safety and mechanical functions, verification of capacity, and verification of the sterilization temperature ----(b)(4)-----.

The results of the OQ demonstrate that the WFI system operates as specified. All deviations associated with the OQ were successfully resolved.

**Performance Qualification (PQ)**

Performance Qualification (PQ) for the WFI System was executed to demonstrate that the WFI system performs according to specification. The parameters qualified are detailed in the table below.

**Water for Injection Parameters Qualified**

[(b)(4)]

-----  
----- (b)(4) -----  
-----  
-----  
-----  
-----

**Monitoring charts of the WFI system**

The results of the in-line instruments that monitor the chemical and physical parameters of the WFI quality and distribution loops were evaluated. The results from each of the

monitor charts correlate with the results obtained from the testing performed in the PQ. The temperature remained at ---(b)(4)----- throughout the duration of the PQ.

**Deviations**

Wyeth recorded nine deviations during the execution of this PQ. All deviations were appropriately investigated and closed out. I agree with Wyeth's assessment that they did not impact the qualification or product quality.

**Routine Monitoring of the WFI System**

The WFI system in Building(b)(4) has ----(b)(4)---- points of use, each of which are routinely sampled and tested ----(b)(4)----- . The worst case use point is sampled and tested (b)(4). The testing is performed to current ----(b)(4)----- . WFI requirements for ----  
------(b)(4)-----

**Contamination and Cross Contamination Controls****Contamination Controls**

Building (b)(4) has been designed to minimize the potential of product contamination and personnel exposure by using primarily ----(b)(4)----- , separate air handling units, pressure differential zones, air locks, gowning rooms, protective clothing and defined pathways for the flow of personnel, equipment, materials and waste.

Manufacturing areas are controlled environments appropriate to the operations that take place in a particular area with pressurization, whether negative or positive, maintained in the area. Room finishes are durable, smooth and cleanable. A gowning room or air lock is located between -----  
------(b)(4)-----  
-----

**Cross Contamination Controls**

The building is designed to keep each manufacturing step segregated. The fermentation and purification areas are physically separated with airlocks at the entrances. Separation includes controlled personnel, material and equipment flows, and environmental controls (e.g., HVAC), all of which are independent of each other.

The facility is capable of manufacturing aseptically-processed drug substances and intermediates. There is no manufacture of products containing penicillin, cephalosporin, live viruses, spore-forming organisms or cytotoxic drugs in Building (b)(4). Site procedures are established to avoid any potential mix-up or cross-contamination between 13vPnC drug substances. To avoid any potential mix-up or cross-contamination between 13vPnC drug substances, only -----(b)(4)----- . Dedicated product-contact equipment is labeled such as -----(b)(4)-----  
----- . All portable equipment is cleaned in accordance with written procedures between batches of the same product. Stationary equipment and process piping is cleaned -----(b)(4)-----

Rooms are cleaned according to department cleaning procedures. Room clearance of components and equipment together with area inspection provides assurance that no



batch specific materials or documents remain from a previous manufacture of a different product. -----(b)(4)-----  
-----

-----**(b)(4)**-----

- -----(b)(4)-----  
-----
- -----(b)(4)-----

-----**(b)(4)**-----

- -----(b)(4)-----
- -----(b)(4)-----  
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- -----(b)(4)-----  
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- -----(b)(4)-----

-----**(b)(4)**-----

- -----(b)(4)-----  
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- -----(b)(4)-----  
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-----**(b)(4)**-----

- -----(b)(4)-----.
- -----(b)(4)-----  
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- -----(b)(4)-----  
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-----**(b)(4)**-----

- -----(b)(4)-----  
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- -----(b)(4)-----.
- -----(b)(4)-----  
-----
- -----(b)(4)-----

7 pages determined not to be releasable; (b)(4)

-----**(b)(4)**-----

----- (b)(4).

## Equipment Cleaning Procedures and Cleaning Validation

Product contact equipment / systems used in the production of the pneumococcal polysaccharide serotypes in Pearl River are dedicated to polysaccharide manufacturing. The product contact surfaces are cleaned using validated procedures.

## Cleaning Procedures

The production contact equipment / systems are cleaned to prepare the equipment/ systems for the subsequent batch. Larger fixed equipment, such, as tanks, and (b)(4)-, are -----(b)(4)----- . Small, easily removed/easy to breakdown equipment, such as drums, gaskets or valves may be -----(b)(4)-----.

These cleaning procedures generally consist of the following steps:

- -----(b)(4)-----.
- -----(b)(4)-----.

All of the steps mentioned utilize -----(b)(4)-----, and the cleaning steps in some cases use cleaning agents for equipment and parts and, -----(b)(4)-----  
-----  
-----, as a ---(b)(4)--- agent for the ---(b)(4)--- and the (b)(4) column.

Routine monitoring is performed for -----(b)(4)-----  
----- in addition to visual inspection of the equipment in order to  
monitor the cleaning process. The results are held to the same requirements as the  
Cleaning Validation for each applicable cleaning process.

## Cleaning Validation

Prior to cleaning validation, commissioning, qualification and cleanability / development studies were performed to demonstrate, through testing, that the equipment / systems perform as designed and are able to reduce challenge material to within the predefined acceptance criteria.

Cleaning validation was performed to demonstrate that the intended cleaning procedures to be used to clean polysaccharide product contact surfaces are effective, robust and consistently meet the requirements for residual product, -----(b)(4)-----  
-----

Cleaning validation studies consisted of three cleaning validation runs using a representative or challenge material held for a defined extended ----(b)(4)-----.

When grouping strategies apply, three runs would be validated on the most challenging

equipment / system and a -----(b)(4)----- would be validated on all other equipment /systems within the defined group.

Sample plans and sample locations were clearly defined in the cleaning validation protocols and are dependent on the equipment being cleaned. Sample locations were selected based on most difficult to clean and representative product-contact locations. The cleaning validation studies are designed to challenge the overall cleaning process. This includes defining the product marker and extended soiled hold time, and identifying the most difficult representative material to clean. Cleaning studies, which rank the relative cleanability of serotypes, demonstrate that the following -----  
----- (b)(4) -----  
-----

-----  
----- (b)(4) -----  
-----  
-----

A solution of -----(b)(4)----- was used to soil the (b)(4) and small parts that are -----(b)(4)----- . Historical information, cleanability studies, or --- (b)(4)-- analysis of the chemical components of soiling solutions were used to support the use of -----(b)(4)----- as a worst-case soil as compared to polysaccharide.

The cleaning validation execution includes the following evaluation:

- -----(b)(4)-----  
-----
- -----(b)(4)-----  
-----  
-----  
-----  
-----
- -----  
----- (b)(4) -----  
-----  
-----  
-----
- -----  
----- (b)(4) -----  
-----
- -----

All of the results met the acceptance criteria detailed in the applicable cleaning validation protocols, establishing validation of the cleaning procedures. The results obtained are detailed within the submission in Section 3.2.A.1, Pearl River, Drug Substance - Building (b)(4), 476-0128-VS-04: Cleaning Validation Summary Report.

**I reviewed 476-0128-VS-04: Cleaning Validation Summary Report and found it to be acceptable. The cleaning procedures/processes associated with cleaning the equipment/systems used in the production of Pneumococcal Polysaccharides were challenged. Results demonstrate that the procedures are robust and reproducible. The Cleaning Validation protocols were completed and the results documented. All cleaning procedures/processes were validated successfully and are suitable for their intended purposes. All deviations recorded by Wyeth have been appropriately investigated and closed out. I do not have any questions or comments.**

**Document # 476-0128-VS-04D Cleaning Validation Summary Report**

**Cleaning Validation Test Method and Acceptance Criteria**

**[(b)(4)]**

-----**(b)(4)**-----

-----**(b)(4)**-----

1. -----  
-----**(b)(4)**-----  
-----  
-----

2. -----  
-----**(b)(4)**-----  
-----  
-----  
-----.

11 pages determined not to be releasable; (b)(4)

----- (b)(4) -----  
-----

-----**(b)(4)**-----

----- (b)(4) -----

- -----(b)(4)-----
- -----(b)(4)-----
- -----(b)(4)-----

----- (b)(4) -----

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---(b)(4)-----

----- (b)(4) -----

----- (b)(4) -----

## Routine Cleaning Monitoring

Routine monitoring is performed for -----(b)(4)-----  
----- in addition to visual inspection of the equipment in order to monitor the  
cleaning process. The results are held to the same requirements as the cleaning validation  
for each applicable cleaning process.

## DRUG PRODUCT

### Pearl River, NY Building (b)(4)

#### Overview of Pearl River Facility Building (b)(4)

Building (b)(4) is a multi-product facility and includes separate areas for component preparation, aluminum phosphate manufacture, and 13vPnC bulk vaccine formulation. The site plan for the Pearl River manufacturing facilities is depicted within the submission in Section 3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW E-079421: Wyeth Pearl River Site Plan. In addition to formulation, component preparation for syringe filling may also be performed in the Building (b)(4) Component Preparation area, which has been fully qualified to support the Building --- (b)(4) --- Floor Component Preparation area as a back up.

----- (b)(4) -----

----- (b)(4) -----

----- (b)(4) -----

----- (b)(4) -----

#### Area Classifications

The area and the environmental classifications are mostly --(b)(4)-- with some more critical areas classified as --(b)(4)-- and the laminar flow units are classified as --(b)(4)- . The area classifications are illustrated on 3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW E-080079: 13V HAC Building --- (b)(4) ----- Floor Area Classification / Air Pressurization.

Environmental monitoring procedures and specifications supporting these area classifications are detailed within the submission in Section 3.2.A.1, Pearl River, Drug Product – Building (b)(4), Environmental Qualification and Monitoring and 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 415-0021-VS-01: Environmental Qualifications and Monitoring Summary Report



## Differential Pressure

Differential pressure of ---(b)(4)--- inches of water are maintained across closed doors between areas of different classifications. The pressure in the ----(b)(4)---- down area with the more stringent classification --(b)(4)-- maintains the highest pressure.

Temperature throughout the Component Preparation area is maintained at -----(b)(4)----- for manufacturing operations. Relative humidity is maintained between a range of -----(b)(4)----- RH.

Differential pressure, temperature and humidity measurements are ----(b)(4)---- monitored and recorded. Alarms for each of these parameters are also monitored and recorded.

**I reviewed the drawings listed above for the Component Preparation Area along with 3.2.A.1, Pearl River, Drug Product – Building (b)(4), Environmental Qualification and Monitoring and 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 415-0021-VS-01: Environmental Qualifications and Monitoring Summary Report and found them to be acceptable. My review for 3.2.A.1, Pearl River, Drug Product – Building (b)(4), Environmental Qualification and Monitoring and 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 415-0021-VS-01: Environmental Qualifications and Monitoring Summary Report is located within this review report.**

### **Building ---(b)(4)--- Floor Aluminum Phosphate and 13vPnC Bulk Formulation**

The manufacturing areas for aluminum phosphate and 13vPnC bulk vaccine formulation are located on the (b)(4) floor and -(b)(4)- from the rest of the building with a -----(b)(4)----- . These areas are classified in accordance with the activities that occur within each area. The areas are illustrated within the submission in Section 3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW E-080078: 13V HVAC Building --- (b)(4) --- Floor Area Classification / Air Pressurization.

(b)(4)

## Area Classifications

The area and the environmental classifications are mostly --(b)(4)- with a few less critical areas classified as --(b)(4)- . The laminar flow unit is classified as --(b)(4)- .

The area classifications are illustrated on 3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW E-080078: 13V HVAC Building --(b)(4)--- Floor Area Classification / Air Pressurization. Environmental monitoring procedures and specifications supporting these area classifications are detailed in 3.2.A.1, Pearl River, Drug Product – Building (b)(4), Environmental Qualification and Monitoring.

### **Differential Pressure**

Differential pressure of --(b)(4)-- inches of water are maintained across closed doors between areas of different classifications. The pressure in the ----(b)(4)---- down area with the more stringent classification --(b)(4)- maintains the highest pressure. Temperature throughout the Component Preparation area is maintained at -----(b)(4)----- for manufacturing operations. Relative humidity is maintained between a range of --- (b)(4)----- RH.

Differential pressure, temperature and humidity measurements are ----(b)(4)---- monitored and recorded. Alarms for each of these parameters are also monitored and recorded.

**I reviewed the drawings listed above for the manufacturing areas for aluminum phosphate and formulated bulk vaccine along with 3.2.A.1, Pearl River, Drug Product – Building (b)(4), Environmental Qualification and Monitoring and 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 415-0021-VS-01: Environmental Qualifications and Monitoring Summary Report and found them to be acceptable. My review for 3.2.A.1, Pearl River, Drug Product – Building (b)(4), Environmental Qualification and Monitoring and 3.2.A.1, Pearl River, Drug Product – Building 215, 415-0021-VS-01: Environmental Qualifications and Monitoring Summary Report is located within this review report.**

### **Environmental Qualification and Monitoring**

#### **Environmental Qualifications**

All areas within Building (b)(4) used for the manufacturing are classified in accordance with the activities that occur within the area and the level of containment and environmental control that is required. Areas are classified per -----(b)(4)-----  
----- -. Classified areas are monitored on a routine basis for viable and non-viable airborne particulates, and viable microorganisms on surfaces. --- (b)(4)----- are used to monitor the clean room surfaces. Personnel monitoring is performed in the --(b)(4)-- area for Building (b)(4); there are no --- (b)(4)--- operations.

The environmental qualifications involved sampling for -----(b)(4)----- days at rest and in operation in the -----(b)(4)----- areas. There are no --(b)(4)-- areas in Building (b)(4). A summary of the qualifications performed is provided in 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 415-0021-VS-01: Environmental Qualifications and Monitoring Summary Report. The testing evaluated multiple sample sites in the various environments for viable microorganisms, using air sampling, settle plates and contact plates, and for non-viable particulates -----(b)(4)----- using particle counters. The number of sample sites in each classification was based on --- (b)(4)----- . The results of the qualifications demonstrated that the classified areas in Building (b)(4) met the environmental quality requirements defined in the protocol. During qualification, all media used was certified for growth promotion prior to use.

Specific sites for each area were selected for the routine monitoring program based on worst case or the data collected during qualification.

**Routine Environmental Monitoring**

Classified areas are monitored for viable and non-viable airborne particulates and viable microorganisms on surfaces (contact plates). Air monitoring for viable microorganisms is performed -----(b)(4)-----, ---(b)(4)----- are exposed for a maximum of (b)(4). Air monitoring for non-viable particulates is performed using -----(b)(4)-----, -----(b)(4)----- Personnel monitoring is performed in the ---(b)(4)--- area for Building (b)(4); there are no ---(b)(4)--- operations.

Summaries of the tests performed, frequency, and action levels for -----(b)(4)----- areas in operation are detailed in the tables below.

**Environmental Monitoring – (b)(4)**

**[(b)(4)]**

**Environmental Monitoring – (b)(4)**

**[(b)(4)]**

**Environmental Monitoring – (b)(4)**

**[(b)(4)]**

**I reviewed 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 415-0021-VS-01: Environmental Qualifications and Monitoring Summary Report and found it to be acceptable. The Building (b)(4) heating, ventilation, and air conditioning (HVAC) environmental qualifications were executed to ensure the graded environments met air quality requirements as detailed in the qualification protocols. All samples met specifications. All deviations associated with the qualification activities have been successfully resolved. The results obtained demonstrate that the Building (b)(4) environments were successfully qualified. I agree with Wyeth's assessment of the**

**deviations as being minor with no impact on the validation. I do not have any questions or comments.**

#### **Flows**

**I reviewed the following flow diagrams and verbal descriptions of the flows for Building (b)(4) and found them to be acceptable. I do not have any questions or comments.**

#### **Flows for Component Preparation Area**

##### **Personnel Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW E-080080: 13V Personnel Flow Diagram Building ---(b)(4)--- Floor.

##### **Equipment and Material Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW E-080081: 13V Material Flow Diagram Building ---(b)(4)--- Floor.

##### **Soiled Equipment/Waste Material Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW E-080082: 13V Solid Waste Flow Building ---(b)(4)--- Floor.

#### **Flows for Aluminum Phosphate and Formulated Bulk Vaccine Manufacturing Areas**

##### **Personnel Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW E-080084: 13V Personnel Flow Diagram Building ---(b)(4)--- Floor.

##### **Component and Material Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4),  
DRW E-080085: 13V Material Flow Diagram Building ---(b)(4)--- Floor.

##### **Product Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW E-080085: 13V Material Flow Diagram Building ---(b)(4)--- Floor.

##### **Soiled Equipment/Waste Material Flow**

3.2.A.1, Pearl River, Drug Product - Building (b)(4), DRW E-080086: 13V Solid Waste Flow Building 215 – (b)(4) Floor

3.2.A.1, Pearl River, Drug Product - Building (b)(4), DRW E-080083: 13V Material Flow Diagram – Building ---(b)(4)--- Floor.

**Contamination and Cross-Contamination Controls – Building 215**

Building (b)(4) is a multi-product facility used in the manufacture of aseptically-processed intermediates and drug products. There is no manufacture of products containing penicillin, cephalosporin, live viruses, spore-forming organisms or cytotoxic drugs.

**Contamination Controls**

Building (b)(4) has been designed to minimize the potential of product contamination and personnel exposure using a combination of controls including separate air handling units, pressure differential zones, air locks, gowning rooms and defined pathways for the flow of personnel, equipment, materials and waste. Manufacturing areas are controlled environments appropriate to the operations that take place in a particular area, with pressurization, whether negative or positive, maintained in the area.

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Site SOPs describe the flow of materials through the facility during the manufacturing process to prevent contamination and mix-ups. Procedures also ensure that appropriate storage conditions are met throughout the manufacturing process.

**Cross-Contamination Controls**

The (b)(4) floor of building (b)(4) consists of (b)(4) segregated suites for formulation. -----  
---(b)(4)---, is dedicated to 13vPnC production. Separation includes controlled personnel, material and equipment flows, and environmental controls (e.g., HVAC).

Each formulation suite has a ---(b)(4)--- and directly opposite a ---(b)(4)---.  
Formulation is performed using automated, ---(b)(4)---. Shared utilities for the formulation --- (b)(4) ---. Raw materials dispensing uses --- (b)(4) ---.  
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----- The booths and scales are cleaned -----  
---(b)(4)--- and ----- (b)(4) -----  
material weighing.

Product-contact equipment is dedicated and labeled. All portable equipment is cleaned in accordance with validated written procedures between batches of product. Stationary equipment and process piping are ----- (b)(4) ----- . Rooms are cleaned per validated written procedures. Line clearance provides assurance that no specific materials or documents remain from a previous manufacture of a different product. More intensive cleaning procedure is used any time a normally sealed/closed portion of a processing room is opened.

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**I reviewed 3.2.A.1, Pearl River, Drug Product - Building (b)(4), 415-0257-VS- 01: Clean Steam Validation Summary Report and 3.2.A.1, Pearl River, Drug Product - Building (b)(4), DRW C-079404: Building (b)(4) WFI/Clean Steam Block Flow Diagram and found them to be acceptable. The qualification demonstrated that the Clean Steam System serving Building (b)(4) operates according to design specifications and is maintained within the design parameters. The system produces clean steam meeting current --- (b)(4) ----- requirements for WFI. Clean steam qualification tests the system's ability to provide ----- (b)(4) ---- clean steam at the point of use. The installation, operational, and performance qualifications for the Clean Steam System were satisfactorily completed, with all deviations associated with the qualification appropriately resolved. I do not have any questions or comments.**

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### Deviation Summary

Deviations encountered during the execution of the qualification studies were investigated by Wyeth. The investigations assessed the potential impact on the qualification studies. The deviation descriptions, resolution and qualification impact are summarized within the submission in Table 5-1. I reviewed the deviations and agree with the investigations and closeout of the deviations.

### Routine Clean Steam Monitoring

Clean Steam quality is monitored by (b)(4) routine sampling and testing of the clean steam -----(b)(4)----- requirements. Additionally, the clean steam system is tested (b)(4) for -----(b)(4)-----.

### Process Compressed Air

The Building (b)(4) Compressed Air System provides compressed air to various process and instrument use points in Building (b)(4).

Compressed air is produced by compressing ambient air to a design pressure of approximately -----(b)(4)----- . The compression is accomplished by (b)(4) air compressor systems that feed a common air receiver. The compressed air is directed to -----(b)(4)-----  
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**I reviewed 3.2.A.1, Pearl River, Drug Product - Building (b)(4), 415-0103-VS-01: Compressed Air Validation Summary and found it to be acceptable. The Process Compressed Air system serving Building (b)(4) at Wyeth, Pearl River, NY is installed as designed and specified, operates within established design parameters, and produces compressed air meeting the qualification testing requirements. The installation, operational, and performance qualifications for the Process Compressed Air system have been satisfactorily completed. All deviations were appropriately inspected and closed out. I agree with Wyeth's assessment that the deviations did not impact the validation. I do not have any questions or comments.**

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### **Performance Qualification Acceptance Criteria**

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### **Deviations**

Deviations encountered during the execution of the qualification studies were investigated by Wyeth. The investigations assessed the potential impact on the qualification studies and on product quality. The deviation descriptions, resolution and qualification impact are summarized within the submission in Table 4-1. I reviewed the deviations and agree with Wyeth's assessment, investigation, and closeout of the deviations.

### **Routine Monitoring of the Processed Compressed Air System**

----- (b)(4) ----- critical use points are sampled and tested at least ----- (b)(4) ----- for ----- (b)(4) --- Viable Particulates and Non-Viable Particulates --- (b)(4) ---- . The presence of ----- (b)(4) ----- and Pressure are ---- (b)(4) ----- measured at the compressed air source.

### **Heating, Ventilation and Air Conditioning**

The Heating, Ventilation, and Air Conditioning (HVAC) systems serving the ----- (b)(4) ---- floors in Building (b)(4) consist of (b)(4) Air Handling Units (AHU). The areas served by each AHU are illustrated within the submission in Section 3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW E-080079A: (b)(4) Floor Area Classification/Air Pressurization and DRW E-080078A: (b)(4) Floor Area Classification/Air Pressurization.

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### **HVAC Qualification**

The HVAC systems servicing the production areas have been qualified. A summary of the qualifications performed is detailed within the submission in Section 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 415-0020-VS-01: HVAC Qualification Summary Report. The qualifications demonstrated that the HVAC systems for the commercial manufacturing areas maintained the classified environments at temperatures of ----- (b)(4)---- relative humidity at --- (b)(4)-----adequate differential pressures between rooms, and minimum air change rate.

Environmental Qualifications were also performed as detailed within the submission in Section 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 415-0021-VS-01: Environment Qualification Summary Report. This document was reviewed and discussed earlier in this report. As part of the qualification, all classified production areas were tested under at rest and in operation conditions. Rooms were monitored for -----  
----- (b)(4) -----  
----- The HVAC qualifications also included the controllers and the Building Management System. In addition, the HEPA filters are regularly certified.

I reviewed 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 415-0020-VS-01: HVAC Qualification Summary Report and 3.2.A.1, Pearl River, Drug Product – Building 215, 415-0021-VS-01: Environment Qualification Summary Report and found them to be acceptable. The Installation and Operational Qualification of the Heating, Ventilation, and Air Conditioning (HVAC) system serving Building --- (b)(4)----- floors demonstrated that the system is installed as designed and specified, and operates within the established design parameters. Environmental monitoring was performed as a Performance Qualification of the HVAC system, as detailed in 3.2.A.1, Pearl River, Drug Product – Building (b)(4), Environmental Qualifications and Monitoring. All deviations were addressed by Wyeth and closed out. None of the deviations had a negative impact on the qualification. I do not have any questions or comments.

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**Water for Injection System**

The WFI System is illustrated in 3.2.A.1, Pearl River, Drug Product - Building (b)(4), DRW C-079405: Building (b)(4) WFI Loop No. (b)(4) Block Flow Diagram and DRW C-079406: Building (b)(4) WFI Loop No. (b)(4) Block Flow Diagram.

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**I have reviewed 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 415-0265-VS-01: Water for Injection Validation Summary Report and found it to be acceptable. The Water for Injection (WFI) system serving Building (b)(4) is installed as designed and specified, operates within the established design parameters, and produces WFI meeting current ----- (b)(4) ----- Requirements. The installation, operational, and performance qualifications for the WFI system have been satisfactorily completed. All deviations recorded by Wyeth have been appropriately investigated and closed out. I agree with Wyeth's assessment that the deviations did not have a negative impact on the qualification. I do not have any questions or comments.**

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## WFI System Parameters Qualified

**[(b)(4)]**

## Deviations

Deviations encountered during the execution of the performance qualification studies were investigated by Wyeth. The investigations assessed the potential impact on the validation study and on product quality. All deviations associated with the Performance Qualification were successfully resolved. The deviation description, resolution and

validation impact are summarized within the submission in Table 4-1. I reviewed the deviations and agree with Wyeth's assessment, investigation, and closeout of the deviations.

## Routine Monitoring of the WFI System

The WFI systems in Building (b)(4) have a total of-(b)(4)- of use and each point of use is routinely sampled and tested at least (b)(4), with the worst case use point sampled (b)(4) to current --- (b)(4)---. WFI requirements for ----- (b)(4)-----  
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## Equipment and Cleaning

### Critical Process Equipment – Building (b)(4)

Critical processing equipment supports the formulation of 13-Valent Pneumococcal Conjugate (13vPnC) vaccine, and manufacturing of Aluminum Phosphate (AlPO4)  
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## Critical Process Equipment

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**I reviewed 401-0100-VS-02: Process Validation Summary Report for 13vPnC Formulation, Filling and Inspection of 13vPnC Syringes at Pearl River and found it to be acceptable. All completed formulation process validation and GMP runs were performed within the established processing parameters for the formulation process, and met all in-process controls and release acceptance criteria. These results validate the formulation process, and establish a -----(b)(4)----- hold time of -(b)(4)- at -----(b)(4)----- and a -----(b)(4)----- vaccine hold time of--- (b)(4)-- at -----(b)(4)----- formulation vessel and -----(b)(4)----- in the ---(b)(4)--- including up to ---(b)(4)-- at -----(b)(4)----- I do not have any questions or comments.**

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### **Process Validation**

The results of the process validation are detailed in 3.2.A.3, Pearl River, Drug Product – Building (b)(4), 415-0208-VS-01: Process Validation Summary Report for Aluminum Phosphate Manufacture in Building (b)(4).

Three full-scale manufacturing lots of AlPO<sub>4</sub> were manufactured in Building (b)(4) using Media Preparation -(b)(4)-. All three process validation lots met the release specifications for aluminum phosphate.

Additionally, the three process validation batches were evaluated for --- (b)(4) --- levels prior to ----- (b)(4) ----- The results obtained met pre-determined acceptance criteria for these parameters.

There were three deviations during the process validation. The deviations were investigated and determined not to impact the validation performed. The results obtained met the acceptance criteria of the study, demonstrating that the manufacturing process consistently produces product that achieves its final quality attributes.

**I reviewed 3.2.A.3, Pearl River, Drug Product – Building (b)(4) 415-0208-VS-03: Media Fill Summary Report and 3.2.A.3, Pearl River, Drug Product – Building (b)(4) 415-0208-VS-01: Process Validation Summary Report for Aluminum Phosphate Manufacture in Building (b)(4) and found them to be acceptable. The three process validation runs performed to validate the manufacture of AlPO<sub>4</sub> ---- (b)(4) ----- using ---- (b)(4) ----- in Building (b)(4) at Wyeth, Pearl River were completed successfully. The results obtained met the acceptance criteria of the study, demonstrating that the manufacturing process consistently produces product that achieves its final quality attributes. Therefore, the production process for manufacture of AlPO<sub>4</sub>**

--(b)(4)---- was successfully validated. In addition, all results met acceptance criteria for the media simulation of Aluminum Phosphate ---(b)(4)---- manufacturing, and confirm that the manipulations necessary to perform an operation utilizing the ----(b)(4)---- within the Building (b)(4) at the Pearl River, NY site do not present a risk to the integrity of the system nor to the manufacture of a product that is free of contaminating microorganisms. Based on this successful media challenge, the system components, manipulations during normal operation, and transfers were successfully qualified. I do not have any questions or comments.

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**Deviations**

Deviations encountered during the execution of the validation study were investigated. The investigations assessed the potential impact on the validation study and on product quality. The deviation description, resolution, and validation impact are summarized in Table 3-1 of the report. I reviewed the deviations and agree with Wyeth's assessment, investigation, and closeout of the deviations.

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**Deviations**

Deviations encountered during the execution of the validation study were investigated. The investigations assessed the potential impact on the validation study and on product quality. The deviation description, resolution, and validation impact are summarized in Table 3-1 within the submission. I reviewed the deviations and agree with Wyeth's assessment, investigation and closeout of the deviations.

**Support Equipment**

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### **Equipment Cleaning Validation**

Cleaning validation has been performed for the equipment and parts used in the manufacture of Aluminum Phosphate (AlPO<sub>4</sub>) --- (b)(4) -- and 13vPnC formulated bulk vaccine. The equipment used for AlPO<sub>4</sub> may also be used for other ----- (b)(4) ----- . Product contact equipment and parts used in 13vPnC production are restricted to the use of Prevnar® and 13vPnC. All the equipment and parts are cleaned using validated procedures. The production equipment and systems are cleaned and sterilized to prepare the equipment and systems for each subsequent batch. Large fixed equipment, such as tanks, is ----- (b)(4) ----- . Small, easily removed, easy to breakdown equipment, such as valves, may be ----- (b)(4) ----- procedures generally consist of ----- (b)(4) ----- .

Routine monitoring is performed for ----- (b)(4) ----- in addition to visual inspection to verify cleanliness. The results are held to the same requirements as the Cleaning Validation for each applicable cleaning process.

### **Cleaning Validation**

The results of cleaning validation are detailed in 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 415-0208-VS-02: Cleaning Validation – Manufacture of Aluminum Phosphate in Building (b)(4), and 415-0210-VS-01: Cleaning Validation – Media Preparation --- (b)(4) --, Cleaning Cycle for 13vPnC Process.

Prior to cleaning validation, commissioning, qualification and cleanability / development studies were performed to demonstrate, through testing, that the equipment / systems perform as designed and are able to reduce challenge material to within the predefined acceptance criteria.

For the cleaning validation for  $\text{AlPO}_4$  equipment, studies were performed following a ----(b)(4)----- Media Simulation and each of three (b)(4) Process Validation runs, with the equipment held for a defined -----(b)(4)----- . For the 13vPnC formulation process, cleaning validation studies were performed following three 13vPnC development studies and (b)(4) runs.

Sampling and testing was performed to demonstrate that the intended cleaning were effective, robust and consistently met the requirements for -----(b)(4)----- . Sample plans and sample locations were clearly defined in the cleaning validation protocols and were dependent on the equipment being cleaned. Sample locations were selected based on most difficult to clean and representative product-contact locations.

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All of the results met the acceptance criteria detailed in the applicable cleaning validation protocols, establishing validation of the cleaning procedures.

**I reviewed 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 415-0208-VS-02: Cleaning Validation – Manufacture of Aluminum Phosphate in Building (b)(4), and 415-0210-VS-01: Cleaning Validation – Media Preparation –(b)(4)-- Cleaning Cycle for 13vPnC Process and found them to be acceptable. Cleaning validation runs were performed to validate the cleaning procedures used to clean the Aluminum Phosphate --- (b)(4) --- manufacturing equipment and the 13vPnC manufacturing equipment used in Building (b)(4) at Wyeth, Pearl River. All results met the pre-determined acceptance criteria for cleanliness including visual inspection, and test results for ----- (b)(4) ----- . These results provided documented evidence that the cleaning procedures are suitable for their intended purpose.**



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**Overview of Pearl River Facilities – Building (b)(4)**

13-Valent Pneumococcal Conjugate Vaccine (13vPnC) is filled, inspected, labeled and packaged, into syringes in the Building (b)(4) complex. The site plan for the Pearl River manufacturing facilities is depicted in 3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW E-079421: Wyeth Pearl River Site Plan.

**Building (b)(4) Complex**

The Building (b)(4) Complex is one building comprised of ----(b)(4)-----, identified as Buildings -----(b)(4)------. The Syringe Filling/Inspection and the Component Preparation areas are located in Building (b)(4) and the Syringe Packaging Line (b)(4) is located in Building (b)(4). The Building (b)(4) Complex is a multi-product facility and includes separate areas for Vaccine Development use. All production areas and systems are built in conformance with current Good Manufacturing Practices.

**Building ---(b)(4)--- Floor Component Preparation Area**

The Building ---(b)(4)--- Floor Component Preparation Area (comprised of Rooms -----(b)(4)----- is serviced by AHU(b)(4), which is a dedicated air handler with -----(b)(4)-----ability.

The Building ---(b)(4)---Floor Component Preparation Area is used for the cleaning and sterilizing of filling/stoppering equipment parts.

**Area Classification**

Areas within the Component Preparation Area are classified in accordance with the activities that occur within each area. The areas are illustrated on the Area Classification 3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW G-080068: Component Preparation Area Classification --(b)(4)-- Floor located within the submission.

**Differential Pressures**

Differential pressure of -----(b)(4)----- are maintained across closed doors between areas of different classifications. The pressure in the room with the more stringent classification ---(b)(4)-- maintains the highest pressure. Temperature throughout the Component Preparation area is maintained at -----(b)(4)----- for manufacturing operations. Relative humidity is maintained between a range of -(b)(4)- RH. Differential pressure, temperature and humidity measurements are continuously monitored and recorded. Alarms for each of these parameters are also monitored and recorded.

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**Area Classifications**

All areas within the Syringe Filling Suite are classified in accordance with the activities that occur within each area and the level of containment, as required. The area classifications are illustrated in 3.2.A.1, Pearl River, Drug Product – Building (b)(4) DRW G-080069: Area Classification Syringe Filling Facility –(b)(4)-- Floor located within the submission.

**Differential Pressures**

Differential pressure of ----(b)(4)----- of water are maintained across closed doors between areas of different classifications. The pressure in the room with the more stringent classification --(b)(4)-- maintains the highest pressure.

Temperature in Room (b)(4) and all supporting classified areas is maintained at --- (b)(4)----- for manufacturing operations. Relative humidity is maintained in a range of -(b)(4)- RH in room (b)(4) and in the supporting classified areas. Differential pressure, temperature and humidity measurements are continuously monitored and recorded. Alarms for each of these parameters are also monitored and recorded.

**Flows**

**I reviewed the following flow diagrams and descriptions and found them to be acceptable. I do not have any questions or comments.**

**Building --(b)(4)-- Floor Component Preparation Area****Personnel Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW G-080104: Personnel Flow Component Preparation Building --- (b)(4)-- Floor.

**Equipment and Material Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW G-080105: Material Flow Component Preparation Building --- (b)(4)-- Floor.

**Soiled Equipment/Waste Material Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW G-080106: Solid Waste Flow Component Preparation Building --- (b)(4)-- Floor.

**Building --- (b)(4) --- Floor Syringe Filling Suite****Personnel Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW G-080100: Personnel Flow Syringe Filling Facility Building --- (b)(4)-- Floor.

**Component/Material Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW G-080101: Material Flow Syringe Filling Facility Building ---(b)(4)-- Floor.

**Product Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW G-080101: Material Flow Syringe Filling Facility Building ---(b)(4)-- Floor.

**Soiled Equipment/Waste Material Flow**

3.2.A.1, Pearl River, Drug Product – Building (b)(4), DRW G-080102: Solid Waste Flow Syringe Filling Facility Building ---(b)(4)-- Floor.

**Contamination and Cross-Contamination Controls****Contamination Controls**

The Building ---(b)(4)-- Floor Syringe Filling and Inspection Suite has been designed to minimize the potential of product contamination and personnel exposure using a combination of controls including: dedicated air handling units, pressure differential zones, air locks, gowning rooms and defined pathways for the flow of personnel, equipment, materials, and waste. Manufacturing areas are controlled environments appropriate to the operations that take place within the particular area with pressurization maintained and monitored in the area. -----(b)(4)-----  
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Site SOPs describe the flow of materials through the facility during the manufacturing process to prevent contamination and mix-ups. Procedures also ensure that appropriate storage conditions are met throughout the manufacturing process. All classified areas are routinely monitored, including viable and non-viable air particulate monitoring, viable surface monitoring, and personnel monitoring.

**Cross-contamination Controls**

The Fill/Finish area is used for aseptically filling 13vPnC and Prevnar into syringes. There is no manufacture of products containing penicillin, cephalosporin, live viruses, spore-forming organisms or cytotoxic drugs in this facility. The Fill/Finish area and site procedures are designed to keep each type of Bulk Formulation segregated. To avoid any potential mix-up or cross-contamination between 13vPnC and Prevnar Bulk Formulations, -----(b)(4)-----

Filling equipment and components being prepared for entry into the filling suite and filled syringes being inspected, including supporting documentation for both activities, are physically segregated within the Fill/Finish area.

A product group changeover procedure is in place for switching from filling and inspection activities between different drug products. Product-contact equipment is dedicated and labeled.

All portable equipment is cleaned and disinfected in accordance with validated written procedures between batches. Stationary equipment is ---(b)(4)--- disinfected as per site procedures. Rooms are cleaned and disinfected using validated disinfectants according to written procedures. Room clearance of components and equipment together with area inspection provides assurance that no specific materials or documents remain from a previous manufacture of a different product. A more intensive cleaning and disinfection procedure is used any time there is a disruption to any controlled environment, as per site procedures.

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**Environmental Qualification and Monitoring – Building (b)(4)****Environmental Qualifications**

The environmental qualifications involved sampling for ---(b)(4)---- days at rest and in operation. A summary of the qualifications performed is provided in 3.2.A.1, Pearl River, Drug Product - Building (b)(4), 422-0103-VS-02: Environmental Qualifications and Monitoring Summary Report. The testing evaluated multiple sample sites in the various environments for viable microorganisms (using ---(b)(4)-----  
-----) and for non-viable particulates----- (b)(4)----- using particle counters. The results of the qualifications demonstrated that the classified areas in Building (b)(4) met the environmental quality requirements defined in the protocol. During qualification, all media used was certified for growth promotion prior to use.

**I reviewed 3.2.A.1, Pearl River, Drug Product - Building (b)(4), 422-0103-VS-02: Environmental Qualifications and Monitoring Summary Report and found it to be acceptable. The ---(b)(4)--- Floor Syringe Filling Suite environmental qualifications were executed to ensure the graded environments met air quality requirements as detailed in the qualification protocols. All deviations associated with the qualification activities have been successfully resolved. The results obtained demonstrate that the Syringe Filling Suite environments were successfully qualified. I do not have any questions or comments.**

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**Environmental Monitoring – (b)(4)**

**[(b)(4)]**

**Building (b)(4) – Utilities****Water for Injection (WFI) System**

The WFI system is illustrated within the submission in Section 3.2.A.1, Pearl River, Drug Product - Building ---(b)(4)-- Floor, DRW C-079403: Component Preparation WFI/Clean Steam Flow Block Diagram. Included in the WFI system are a -----

----- (b)(4) -----

----- Distribution pumps in Building (b)(4) continuously circulate and supply WFI to the points of use. The WFI distribution loop (----- (b)(4) -----) and the associated equipment in Building (b)(4) are --- (b)(4) --- sanitized. The WFI is maintained at ----- (b)(4) ----- All parts wetted by feed water and WFI are manufactured with ----- (b)(4) -----

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**I have reviewed 3.2.A.1, Pearl River, Drug Product - Building –(b)(4) Floor, DRW C-079403: Component Preparation WFI/Clean Steam Flow Block Diagram and 3.2.A.1, Pearl River, Drug Product – Building (b)(4), 422-0110-VS-01: Water for Injection Qualification Summary Report and found it to be acceptable. The Water for Injection (WFI) system serving the (b)(4) Floor Component Preparation Area in Building (b)(4), Wyeth, Pearl River, NY is installed as designed and specified, operates within the established design parameters, and produces WFI meeting current ----- (b)(4) ----- requirements. All deviations were successfully resolved. The installation, operational, and performance qualifications for the WFI system have been satisfactorily completed. I do not have any questions or comments.**



1 page determined not to be releasable; (b)(4)

## Shutdown WFI Quality Testing

WFI Quality Tests were performed to verify that the water quality within the WFI System meets the specified acceptance criteria following a shutdown of the system for a minimum of (b)(4) with the WFI Storage Tank at approximately (b)(4) full (worst-case volume). Following shutdown, (b)(4) sample ports were sampled (b)(4) and all samples met the specified acceptance criteria for description, (b)(4) (b)(4).

## Deviations

Wyeth recorded the deviations encountered during the execution of this protocol within the submission in Table 4-1. I reviewed the deviations and all investigations and exceptions encountered during the PQ executions were investigated and satisfactorily addressed.

## Routine Monitoring of the WFI System

The WFI system in Building (b)(4) has ---(b)(4)---- of use, each of which are sampled and tested as per monitoring program. The worst-case use point is sampled and tested (b)(4). The testing is performed to current ---(b)(4)----- . WFI requirements for -----(b)(4)-----

## Clean Steam System

The Clean Steam System serving Building (b)(4) consists of (b)(4) Clean Steam Generator.  
----- (b)(4) -----

-----(b)(4)----- to the points of use located in the classified areas.  
 The Clean Steam System is illustrated within the submission in Section 3.2.A.1, Pearl  
 River, Drug Product - Building ---(b)(4)--- Floor, DRW C-079403: Component  
 Preparation WFI/Clean Steam Flow Block Diagram.

## Clean Steam Validation

The Clean Steam System serving Building (b)(4) has been validated and is re-qualified (b)(4)--. The validation of the clean steam system is detailed within the submission in Section 3.2.A.1, Pearl River, Drug Product - Building (b)(4), 422-0111-VS-01: Clean Steam Validation Summary Report and demonstrates that the system operates according to design specifications and is maintained within the design parameters. Clean Steam qualification tests the system's ability to provide ---(b)(4)----- clean steam at the points of use. The Clean Steam system for the commercial manufacturing areas was designed and qualified to meet the criteria for the following tests as specified in -----(b)(4)-----

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I reviewed 3.2.A.1, Pearl River, Drug Product - Building (b)(4)---- Floor, DRW C-079403: Component Preparation WFI/Clean Steam Flow Block Diagram and 3.2.A.1, Pearl River, Drug Product - Building (b)(4), 422-0111-VS-01: Clean Steam Validation Summary Report and found them to be acceptable. The Clean Steam System serving the (b)(4) Floor Component Preparation Area in Building (b)(4) at Wyeth, Pearl River is installed as designed and specified, operates within the established design parameters, and produces clean steam meeting current ----- (b)(4)----- requirements for WFI. All deviations associated with the qualification activities have been successfully resolved. The installation, operational, and performance qualifications for the Clean Steam System were satisfactorily completed. I do not have any questions or comments.

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#### **Deviations**

Wyeth recorded the deviations encountered during the execution of this protocol within the submission in Table 5-1. I reviewed the deviations and all deviations were investigated and satisfactorily resolved.

#### **Routine Clean Steam Monitoring**

Clean Steam quality is monitored by routine (b)(4) sampling and testing of the clean steam ----- (b)(4) ----- requirements. Additionally, the clean steam system is tested --(b)(4)-- for ----- (b)(4) -----.

#### **Heating, Ventilation and Air Conditioning**

The Heating, Ventilation, and Air Conditioning (HVAC) systems serving the Fill Finish Production Area are composed of ----- (b)(4) ----- serving Building --(b)(4)-----  
----- Syringe Filling Suite and the other serving Building ---(b)(4)----- Floor Component Preparation Area. The HVAC system for the (b)(4) floor Syringe Suite is illustrated within the submission in Section 3.2.A.1, Pearl River, Drug Product - Building

(b)(4), DRW: G-080217: AHU Supply Syringe Filling Facility Building (b)(4) – Second Floor. The HVAC system for the (b)(4) floor Component Preparation area is illustrated within the submission in Section 3.2.A.1, Pearl River, Drug Product - Building (b)(4), DRW: G-079402: Building ---(b)(4)--- Floor Component Preparation AHU Supply.

The (b)(4) Syringe Filling Suite is served by an HVAC system comprised of (b)(4) Air Handling Units (AHUs): -----(b)(4)-----  
----- The (b)(4) Floor Component Preparation Area is served by a separate HVAC system comprised of a -----(b)(4)----- that supplies conditioned air to --(b)(4)-- rooms and a corridor.

The airflow, temperature, relative humidity, and pressurization of each room are monitored and controlled by the HVAC control system. The HVAC systems are designed to provide a minimum air change rate of (b)(4) air volume exchanges per hour for each production area, with greater exchanges where required to maintain the various design conditions. The temperatures in the classified environments, during normal operation, range from -----(b)(4)----- Relative Humidity levels in the classified environments are maintained at ----(b)(4)---- The facility pressurization is managed by a dynamic pressure control system. The room pressures are controlled with respect to a common reference pressure such that desired pressurization across each closed door is achieved. In certain areas, the space below the -----(b)(4)-----  
----- The areas surrounded -----(b)(4)-----  
----- All classified areas are provided with terminal ---(b)(4)----- HEPA filters.

**I reviewed 3.2.A.1, Pearl River, Drug Product - Building (b)(4), DRW: G-080217: AHU Supply Syringe Filling Facility Building --(b)(4)--- Floor and 3.2.A.1, Pearl River, Drug Product - Building (b)(4), DRW: G-079402: Building --(b)(4)--- Floor Component Preparation AHU Supply and found them to be acceptable. I do not have any questions or comments.**

### **HVAC Qualification**

The HVAC systems servicing the production areas have been qualified. A summary of the qualifications performed is detailed within the submission in Section 3.2.A.1, Pearl River, Drug Product - Building (b)(4), 422-0103-VS-01: HVAC Qualification Summary Report. The qualifications demonstrated that the Building (b)(4) classified environments maintained temperatures of -----(b)(4)-----, relative humidity of ---(b)(4)-----, adequate differential pressures between rooms, and minimum air change rates of (b)(4) air volume exchanges per hour, with greater exchanges where required to maintain the various design conditions.

Environmental Qualifications were also performed, as detailed in 3.2.A.1, Pearl River, Drug Product - Building (b)(4), 422-0103-VS-02: Building (b)(4) Classified Environment Qualification Summary Report. During qualification all classified production areas were tested under at rest and in operation conditions. Rooms were monitored for -----(b)(4)-----

----- (b)(4) -----  
-----

The HVAC system qualifications also included the controllers and the Building Management system. Additionally, the HEPA filters are re-certified every (b)(4).

**I reviewed 3.2.A.1, Pearl River, Drug Product - Building (b)(4), 422-0103-VS-01: HVAC Qualification Summary Report and 3.2.A.1, Pearl River, Drug Product - Building (b)(4), 422-0103-VS-02: Building (b)(4) Classified Environment Qualification Summary Report and found them to be acceptable. My review of 422-0103-VS-02 is contained in a previous section of this report. My review of 422-0103-VS-01 is below. Installation and Operational Qualification of the Heating, Ventilation, and Air Conditioning (HVAC) system and associated Down Flow Laminar Air Flow Units serving Fill/ Finish Production Areas (b)(4) Floor Syringe Filling Suite and (b)(4) Floor Component Preparation Area) in Building (b)(4) demonstrated that the system is installed as designed and specified, and operates within the established design parameters. Environmental monitoring was performed as a Performance Qualification of the HVAC system. I do not have any questions or comments.**

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**Routine HVAC Monitoring**

The Building Management system controls and monitors both the HVAC systems and the production areas served. The system collects data such as equipment status, room pressurization, temperature, and relative humidity, and provides a graphical user interface to view the data in the form of trends or tables.

**Process Compressed Air**

The Building (b)(4) Complex PCA System provides (b)(4) compressed air to various equipment and instruments located throughout the Building (b)(4) complex, including the -----(b)(4)----- on the (b)(4) floor of Building (b)(4). This system is supplied by central compressed air equipment located in the Building -----(b)(4)-----.

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In addition to process compressed air,---(b)(4)--- compressed air, regulated to the applicable pressure requirements, is provided to -----(b)(4)-----  
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**Validation of the Processed Compressed Air System**

A summary of the qualifications performed is detailed within the submission in Section 3.2.A.1, Pearl River, Drug Product - Building (b)(4), 422-0072-VS-03: Plant Compressed Air System Validation Summary Report and demonstrates that the system operates according to design specifications.

The following functions have been verified by testing for the Process Compressed Air system at Building (b)(4), Pearl River:

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**I reviewed 3.2.A.1, Pearl River, Drug Product - Building (b)(4), 422-0072-VS-03: Plant Compressed Air System Validation Summary Report and found it to be acceptable. The Building (b)(4) Complex, (b)(4) Process Compressed Air (PCA) system serving the (b)(4) floor of Building (b)(4) at Wyeth, Pearl River is installed as designed and specified, operates within the established design parameters, and produces**



compressed air meeting qualification testing requirements. All deviations were successfully resolved. The installation, operational, and performance qualifications for the PCA system have been satisfactorily completed. I do not have any questions or comments.

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**Process Compressed Air Performance Qualification Acceptance Criteria**

[(b)(4)]

**Deviations**

There were two deviations during the IQ execution and no deviations during the OQ. All deviations were investigated and satisfactorily resolved. There were no deviations generated during PQ execution.

**Routine Monitoring of the Processed Compressed Air System**

Process air supplied to the -----(b)(4)-----  
----- are sampled and tested at -----(b)(4)----- for Viable Particulates  
and Non-viable Particulates --(b)(4)--. The presence of ---(b)(4)----- and ---(b)(4)---  
are continuously measured at the compressed air points of use.

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### **Final Product Testing**

Final product test results are summarized within the submission in Table 3-12. All final product test results met the pre-determined acceptance criteria. This testing includes sterility testing. Sterility testing is also included during stability studies at Initial, 12, 24, (b)(4) and (b)(4) months. The specification is “Meets the requirement of the test; no growth observed”.

### **Deviations**

Deviations to the process validation protocols were investigated and assessed for their potential impact on the validation study. The deviations were reviewed and approved by Quality Assurance. The deviation description, resolution and validation impact associated with the data in this validation summary are summarized within the submission in Table 4-1 and Table 4-2. I reviewed the deviations and agree with Wyeth’s assessment, investigation and closeout of the deviations.

### **Autoclaves**

The (b)(4) sterilization autoclaves are located between Rooms --- (b)(4) ----- in Building (b)(4) and are used for sterilization of equipment used for the filling of syringes.  
----- (b)(4) -----  
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Both autoclaves have been qualified by performing Installation, Operation, and Performance Qualification. The autoclaves are re-qualified every (b)(4). The validation of the autoclaves is detailed in 3.2.A.1, Pearl River, Drug Product – Building (b)(4), Report 422-0106-VS-01: Autoclave PQ Summary Report and demonstrates that the equipment operates according to design specifications and is maintained within the design parameters.

**I reviewed 422-0106-VS-01: Autoclave PQ Summary Report and found it to be acceptable. Installation (IQ), Operational (OQ) and Performance Qualification (PQ) runs were performed to validate the ----- (b)(4) ----- located on the (b)(4) floor of Building (b)(4) at Wyeth, Pearl River. The PQ runs consisted of worst-case minimum and maximum load configurations. The data obtained from each of three consecutive runs met the acceptance criteria for heat**

**distribution and heat penetration, including inactivation of Biological Indicators, and minimum  $F_0$  values of (b)(4). I do not have any questions or comments.**

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**Autoclave Performance Qualification Testing Parameters**

**[(b)(4)]**

The data obtained from ----(b)(4)----- runs from each of the (b)(4) autoclaves met all the acceptance criteria for the worst-case minimum and maximum load configurations.

**Deviations**

Deviations encountered during the execution of the PQ were investigated. The investigations assessed the potential impact on the validation study and on product quality. The deviation description, resolution, and validation impact are summarized within the submission in Table 4-1. I reviewed the deviations and agree with Wyeth's assessment, investigations and closeout of the deviations.

**Fill/Finish Product Contact Equipment and Parts Cleaning Validation**

Product contact equipment/parts used in the filling and finishing of syringes in Pearl River are dedicated to Prevnar<sup>®</sup> and 13vPnC. The equipment/parts are ----(b)(4)----- since all of the cleaned items (----- (b)(4) -----) consist of small, easily removed/easy to breakdown equipment.

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**I reviewed 422-0112-VS-01: Cleaning Validation Summary Report and found it to be acceptable. Three cleaning validation runs were performed to validate the cleaning procedures used to clean the 13vPnC vaccine filling equipment used in Building (b)(4). All results obtained met the pre-determined acceptance criteria for cleanliness, including visual inspection, and test results for ----- (b)(4) ----- levels. These results provide documented evidence that the cleaning procedures are suitable for their intended purposes. I do not have any questions or comments.**

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**Overview of (b)(4) Facilities (written by NW)**

----- (b)(4) -----  
----- The facility is situated on an approximately (b)(4)-acre lot inside an industrial zone on the city's west side, as illustrated in 3.2.A.1, (b)(4), Drug Product – --- (b)(4)---, Drawing CIVA- 002: Site Plan. ----- (b)(4) -----  
----- 13-Valent Pneumococcal Conjugate Vaccine (13vPnC) is formulated and filled in --- (b)(4) ---.

--- (b)(4) ---

--- (b)(4) --- is a multi-product facility and includes separate areas for component preparation, 13vPnC bulk vaccine formulation, and 13vPnC syringe filling. All production areas and systems comply with current Good Manufacturing Practices.

**Area Classifications**

The controlled areas in --- (b)(4) --- are classified in accordance with the activities that occur within each area. The area classifications are illustrated on 3.2.A.1, --- (b)(4) ---, Drug Product – --- (b)(4) ---, Drawing ROM-D-PRD5, Classified Environments, Production Block, (b)(4) Floor - --- (b)(4) ---, and 3.2.A.1, (b)(4) ---, Drug Product – --- (b)(4) ---, Drawing ROM-D-PRD6, Classified Environments, Production Block, --- (b)(4) --- Floor - -- (b)(4) ---. Environmental monitoring procedures and specifications supporting these area classifications are detailed in 3.2.A.1, (b)(4) ---, Drug Product – --- (b)(4) ---, Environmental Qualification and Monitoring.

**Differential Pressure**

Differential pressure ranges of ----- (b)(4) ----- are maintained in positive-pressure rooms. All critical areas are maintained at --- (b)(4) --- inches of positive pressure relative to lower classified rooms. Temperature in all clean rooms is maintained at --- (b)(4) ----- during manufacturing operations. Differential pressure between rooms, temperature, and humidity are measured in some critical rooms on a continuous basis using the ----- (b)(4) -----.

**Component Preparation Area**

The Component Preparation Area is designed to support cleaning, preparation and sterilization of ----- (b)(4) ----- and other miscellaneous parts used for manufacturing operations. The Component Preparation Area is located on the (b)(4) floor and is -- (b)(4) ----- (b)(4) -----  
----- The areas and their environmental classifications are --- (b)(4) ---.

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### **Environmental Qualifications and Monitoring**

All areas within the Production Block are classified in accordance with the activities that can occur within that area and the level of containment required. Areas are classified as per ----- (b)(4) -----  
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### **Environmental Qualifications**

The environmental qualifications performed by (b)(4) involved (b)(4) days of static (Inactive) monitoring and (b)(4) days of dynamic (Active) monitoring in the --- (b)(4) ----- areas. A summary of the qualifications is provided within the submission in Section 3.2.A.1, (b)(4), Drug Product – --- (b)(4) ---, SR REC 31551, Environmental Monitoring Performance Qualification Summary Report: (b)(4) – --- (b)(4) ---. The testing evaluated multiple sample sites in the various environments for viable microorganisms (----- (b)(4) -----) and non-viable particulates ----- (b)(4) ----- . The results of the qualifications demonstrated that the classified areas in --- (b)(4) --- met the environmental quality requirements defined in the protocol. Based on the data collected, specific sites for each area were selected for the routine monitoring program.

**I reviewed 3.2.A.1, (b)(4), Drug Product – --- (b)(4) ---, SR REC 31551, Environmental Monitoring Performance Qualification Summary Report: ----- (b)(4) ----- and found it to be acceptable. I do not have any questions or comments.**

### **Environmental Monitoring**

Summaries of the tests performed, frequency, and action levels for Personnel, ----- (b)(4) ----- and gowning areas are detailed in the tables below. The frequency and action levels in the tables and the text below are subject to change based on (b)(4) -- review and trending of monitoring results obtained, in order to continually improve the program.

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----- (b)(4) -- Flows

**I reviewed the following diagrams and descriptions and found them to be acceptable. I do not have any questions or comments.**

**Personnel Flow**

3.2.A.1 (b)(4)- Drug Product ---- (b)(4) ---, DMF-D-1 Personnel Flow --- (b)(4) -- Floor

3.2.A.1 (b)(4)- Drug Product – --- (b)(4) ---, DMF-D-2 Personnel Flow --- (b)(4) -- Floor

**Material and Component Flow**

3.2.A.1 (b)(4)- Drug Product – --- (b)(4) ---, DMF-D-5 Material and Component Flow --- (b)(4) -- Floor

3.2.A.1 (b)(4)- Drug Product – --- (b)(4) ---, DMF-D-6 Material and Component Flow -- (b)(4) -- Floor

**Product Flow**

3.2.A.1 (b)(4)- Drug Product – --- (b)(4) ---, DMF-D-3 Product Flow First Floor

3.2.A.1 (b)(4)- Drug Product – --- (b)(4) ---, DMF-D-4 Product Flow --- (b)(4) -- Floor

**Waste Flow**

3.2.A.1 (b)(4)- Drug Product – --- (b)(4) ---, DMF-D-7 Waste Flow --- (b)(4) -- Floor

3.2.A.1 (b)(4)- Drug Product – --- (b)(4) ---, DMF-D-8 Waste Flow --- (b)(4) -- Floor

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### **Inspection of Filled Syringes**

Inspection of the 13vPnC filled syringes was performed in (b)(4) stages. In the (b)(4) stage, an in-process inspection was performed for ----- (b)(4) -----  
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----- This  
practice allowed fill operators to be notified about rejected syringes and to take necessary  
corrective actions. Counts of acceptable and rejected syringes were documented.

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For the three process validation lots, the net inspection acceptance rates were -----  
(b)(4)----- meeting the acceptance criterion of (b)(4) inspection rejection rate.  
During the first half of the automated inspection of batch --(b)(4)-- (packing batch  
--(b)(4)---), a high number of syringes were rejected for --(b)(4)--. Examination of the  
rejected syringes determined that the automated inspection machine was falsely rejecting  
acceptable syringes. Re-inspection of the rejected syringes was performed per site  
procedures and the total number of rejects for the lot was subsequently determined to be  
(b)(4). The quality of the inspection process was monitored by QA through statistical  
sampling according to --(b)(4)--- and manual inspection of samples, as detailed in Table  
3-13. All three lots met the AQL acceptance criteria.

### **Final Product Testing**

Filled syringes were sampled for testing across each of the three process validation runs.  
Samples for testing were obtained according to the Production Batch Records and the  
validation protocol. The testing of the three process validation lots was expanded from  
the routine release testing for commercial manufacture with ----- (b)(4) ----- and  
----- (b)(4) ----- testing performed at ----- (b)(4) ----- of fill for each lot, in  
addition to standard release testing. ---- (b)(4) ----- testing was performed for process  
validation only, and will not be continued as a release test. All final product test results  
met the pre-determined acceptance criteria.

### **Exceptions and Deviations**

Exceptions/deviations encountered during the process validation runs were investigated.  
The investigations assessed the potential impact on the validation performed and impact  
to product Safety, Identity, Strength, Purity, and Quality (SISPQ). The deviation  
description, resolution, and validation impact are summarized in Table 4-1 within the  
submission. I reviewed the deviations and found them to be investigated and closed out  
appropriately.

### **Equipment Cleaning Validation**

Cleaning validation was performed for the equipment and parts used in the formulation  
and filling of 13-Valent Pneumococcal Conjugate (13vPnC) Vaccine at (b)(4). The  
product-contact equipment and parts used for 13vPnC are dedicated. All equipment and  
parts will be cleaned using validated cleaning procedures.

-----**(b)(4)**-----



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All results met the acceptance criteria set forth in the cleaning validation protocol, establishing validation of the cleaning procedures.

**I reviewed SR CV0804002: Summary Report for Cleaning Validation of the Process Equipment Associated with the Formulation and Filling of 13-Valent Pneumococcal Conjugate (13vPnC) Vaccine on -----(b)(4)----- and found it to be acceptable. Three cleaning validation runs were performed to validate the cleaning procedures used to clean the 13vPnC vaccine formulation and filling equipment used in -----(b)(4)----- . All results obtained met the pre-determined acceptance criteria for cleanliness, including visual inspection, and test results for -----(b)(4)----- . These results provide documented evidence that the cleaning procedures are suitable for their intended purpose. I do not have any questions or comments.**

**SR CV0804002 Validation Summary Report for Cleaning the Process Equipment Associated with the Formulation and Filling of 13-Valent Pneumococcal Conjugate (13vPnC) Vaccine on -----(b)(4)-----**

Cleaning validation was performed using the dedicated -----(b)(4)----- and associated parts designated for use with 13vPnC vaccine. Following soiling, the process equipment was held for at least -----(b)(4)----- prior to cleaning. The table below includes the -----(b)(4)----- for the three validation runs.

**[(b)(4)]**

The validation runs were performed using (b)(4) cleaning cycle parameters from those specified for routine cleaning to provide a worst case challenge for the cleaning procedures. The cleaning procedures and validation parameters challenged are detailed in Table 2-2 within the submission.

-----**(b)(4)**-----

(b)(4)

## Acceptance Criteria

The acceptance criterion for each test performed is listed in the following table:

## Cleaning Acceptance Criteria

**[(b)(4)]**

All results met the acceptance criteria set forth in cleaning validation protocol.

## Exceptions

The Exceptions that occurred during the execution of protocol CV0712001 are detailed in Table 4-1 within the submission. I reviewed the exceptions and found the investigation and closeout to be acceptable.

## Contamination and Cross-Contamination Controls – (b)(4)

The -----(b)(4)----- facility is operated as a multi-product facility for the manufacture of aseptically processed intermediates and drug products. A complete list of products currently manufactured at (b)(4) can be found in the -----(b)(4)-----, Section 3: *Biologic Products*. All new products are evaluated for potential impact to current commercial products as described in Section 5.9: *New Product Evaluation* of the Drug Master File. (b)(4) provides appropriate notifications to Wyeth and regulatory authorities for any new products to be manufactured in those areas supporting 13vPnC.

There is no manufacture of products containing penicillin, cephalosporin, live viruses, spore-forming organisms or cytotoxic drugs.

### Contamination Controls

---(b)(4)--- has been designed to minimize the potential of product contamination using a combination of controls including separate air handling units, pressure differential zones, air locks, gowning rooms and defined pathways for the flow of personnel, equipment, materials and waste. Manufacturing areas are controlled environments appropriate for the operations that take place in each particular area, with required differential pressurization, whether negative or positive, maintained in the areas. -----

----- (b)(4) -----  
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Site SOPs describe the flow of materials through the facility during the manufacturing process to prevent contamination and mix-ups. Procedures also ensure that appropriate storage conditions are met throughout the manufacturing process. All classified areas are regularly monitored, including viable and non-viable air particulate monitoring, viable surface monitoring and personnel monitoring.

### Cross-Contamination Controls

---(b)(4)---- consists of (b)(4) segregated suites for formulation, (b)(4) segregated suites -  
----- (b)(4) ----- . Separation controls  
include controlled flows for personnel, material and equipment, and environmental  
controls (e.g., HVAC). To avoid any potential mix-up or cross-contamination, -----  
----- (b)(4) ----- .

Product-contact equipment is dedicated and labeled. All portable equipment is cleaned and disinfected in accordance with validated written procedures between batches of product. Stationary equipment and process piping are ----(b)(4)----- using a  
----- (b)(4) --. Rooms are cleaned and disinfected per validated written  
procedures. Room clearance procedures for components and equipment, together with  
area inspections, provide assurance that no specific materials or documents remain from  
the previous manufacture of a different product, or a different lot of the same product. A  
more intensive cleaning and disinfection procedure is used any time there is a disruption  
to any controlled environment, as per site procedures.

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#### -----**(b)(4)**----- – Utilities

##### **Heating Ventilation and Air Conditioning**

The Heating Ventilation and Air Conditioning (HVAC) system serving the ---**(b)(4)**----- classified areas at --**(b)(4)**-- is composed of a **(b)(4)** system, **(b)(4)**, serving ---**(b)(4)**----- floor classified areas. The areas served by **(b)(4)** are illustrated within the submission in Section 3.2.A.1, **(b)(4)**, Drug Product – -----**(b)(4)**-----, HVC-D-001 HEPA Filter Locations – ---**(b)(4)**----- Section 3.2.A.1, **(b)(4)**, Drug Product – ---**(b)(4)**--, HVC-D-002 HEPA Filter Locations – **(b)(4)** Floor.

All classified areas are equipped with HEPA filters or -----**(b)(4)**----- filters. The zone air handlers are designed to provide a minimum air change rate of **(b)(4)** air volume exchanges per hour for each production area, with greater exchanges where required to maintain the various design conditions. During manufacturing operations, temperature is maintained at --**(b)(4)**-- inside the filling room and at -----**(b)(4)**----- in

the aseptic formulation rooms, and relative humidity is maintained at ----(b)(4)----- in these areas. All critical areas are maintained at --- (b)(4)----- of positive pressure relative to lower classified rooms. The temperature and pressurization of each room is monitored and controlled by the HVAC control system.

### **HVAC Qualification**

The HVAC systems servicing the production areas have been qualified. A summary of the qualifications performed is detailed within the submission in Section 3.2.A.1 (b)(4), Drug Product – --- (b)(4)----, SR US1082-Q-OQP-0001: Summary Report for the Installation and Operational Qualification of HVAC System (b)(4), Serving --- (b)(4)---- at (b)(4). Environmental Qualifications were also performed as detailed in the submission in Section 3.2.A.1 (b)(4), Drug Product ----- (b)(4)-----, SR REC 31551: Environmental Monitoring Performance Qualification Summary Report: ----- (b)(4)----- ----- . As part of the qualification, all classified production areas were tested under static and dynamic conditions. Rooms were monitored for total particulate levels, airborne viable particulates, and surface viable levels.

### **HVAC Monitoring**

The air handling system is monitored by a validated computer-based system. This system is networked to gather and record data for temperature and pressure of critical areas and equipment. The system is equipped with visual and telecommunications alarms for filling and support areas, incubators, refrigerators, and freezers.

**I reviewed SR US1082-Q-OQP-0001: Summary Report for the Installation and Operational Qualification of HVAC System (b)(4), Serving ----(b)(4)----- and SR REC 31551: Environmental Monitoring Performance Qualification Summary Report: -----(b)(4)----- and found them to be acceptable. Installation and Operational Qualification of the Heating Ventilation and Air Conditioning (HVAC) system serving the -----(b)(4)----- Classified Areas of ----(b)(4)----- at -----(b)(4)----- demonstrated that the system is installed as designed and specified, and operates within the established design parameters. The qualifications demonstrated that the HVAC systems for the commercial manufacturing areas maintained the classified environments at temperatures of -----(b)(4)-----, relative humidity at ----(b)(4)----, a differential pressure of ---- (b)(4)----- of positive pressure relative to lower classified rooms, and provided air exchange rates of at least (b)(4) air exchanges per hour. Environmental monitoring was performed as a Performance Qualification of the HVAC system, as detailed within the submission in Section 3.2.A.1, (b)(4), Drug Product – --(b)(4)----, Environmental Qualifications and Monitoring. The EMPQ performed for ----- (b)(4)----- demonstrated that all the classified rooms were capable of maintaining dynamic and static operating conditions within the proposed limits for quantitative viable air, qualitative viable air and non-viable particulate levels ----(b)(4)----- --. Additionally, the viable surface results demonstrated that adequate sanitization and maintenance programs are in place. I do not have any questions or comments.**

1 page determined not to be releasable; (b)(4)

**EMPQ Action Limits: Air Viable Samples**

[(b)(4)]

-----**(b)(4)**-----

-----**(b)(4)**-----  
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**Deviations and Exceptions**

There were 4 classified areas that generated 15 excursions or deviations during the execution of the EMPQ. These excursions were investigated via the Microbiological Investigation Report (MIR) system. Details of the excursions and investigations are summarized in Table 4-1 of the submission. I reviewed the deviations and found the investigation and closeout of the deviations to be acceptable.

**Water for Injection System**

The WFI system is illustrated within the submission in Section 3.2.A.1, (b)(4), Drug Product – ----(b)(4)--- DRW US1082-PPID- 0001 ----(b)(4)---- WFI P&ID. WFI is produced by -----

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**Validation of the WFI System**

A summary of the validations performed is provided within the submission in Section 3.2.A.1 (b)(4), Drug Product – --- (b)(4)-----, Report SR US1082-Q-OQP-0003, WFI Validation Summary Report.

The following test functions have been met for the Water Systems:

1. All of the critical controls, alarms, and indicators operate according to design specification.
2. Chemical tests on all sites met the limits established in -----(b)(4)----- compendia.
3. Microbial limit, aerobic count, is not more than -----(b)(4)-----.
4. -----(b)(4)----- limit is not more than -----(b)(4)-----.

**Routine Monitoring of the WFI System**

WFI is sampled from the formulation ports (b)(4) during production periods, and (b)(4) during non-production periods, for -----(b)(4)----- The non-formulation ports are sampled (b)(4) for -----(b)(4)-----, and --(b)(4)-- for --- (b)(4)----- testing. A designated WFI port is sampled (b)(4) for -----(b)(4)----- and --(b)(4)----- testing. The microbial action limits are detailed in the table below.

**Water System Microbial Action Levels**

[(b)(4)]



I reviewed Report SR US1082-Q-OQP-0003, WFI Validation Summary Report and found it to be acceptable. The Water for Injection (WFI) system serving ----(b)(4)----- is installed as designed and specified, operates within the established design parameters, and produces WFI meeting current -----(b)(4)----- requirements. All deviations have been successfully resolved. The installation, operation, and performance qualifications for the WFI system have been satisfactorily completed. I do not have any questions or comments.

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**WFI Parameters Qualified**

[(b)(4)]

(b)(4)

-----**(b)(4)**-----

(b)(4)

(b)(4)

## Clean Steam Validation

The Clean Steam System serving -----(b)(4)----- has been validated and is re-qualified ----(b)(4), as detailed below. The validation is summarized within the submission in Section 3.2.A.1, (b)(4), Drug Product – ---(b)(4)-----, US1082-Q-OQP-0024: Summary Report for the Installation, Operational and Performance Qualification of the Clean Steam System. The Clean Steam System was designed and qualified to meet current ---(b)(4)----- requirements for WFI, specifically:

- -----(b)(4)-----
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## Routine Clean Steam Monitoring

Clean Steam quality is monitored by routine sampling and testing of the clean steam --(b)(4)-- to -----(b)(4)-----, WFI requirements for -----(b)(4)-----  
-----, Each formulation port is sampled and tested every ---(b)(4)---  
and during ---(b)(4)--- if there are manufacturing activities. Additionally, the clean  
steam system is tested -----(b)(4)-----.

I reviewed US1082-Q-OQP-0024 Summary Report for the Installation, Operational and Performance Qualification of the Clean Steam System at (b)(4) and found it to be acceptable. The Clean Steam System serving -----(b)(4)----- is installed as designed and specified, operates within the established design parameters, and produces clean steam meeting current ----(b)(4)----- requirements for WFI. All deviations associated with the qualification activities have been successfully resolved. The installation, operational, and performance qualifications for the Clean Steam System were satisfactorily completed. I do not have any questions or comments.

**US1082-Q-OQP-0024 Summary Report for the Installation, Operational and Performance Qualification of the Clean Steam System at (b)(4)**

-----**(b)(4)**-----

----- (b)(4)

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----- (b)(4)

## Pure Steam Distribution Systems Parameters Qualified



2. -----(b)(4)-----  
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3. -----(b)(4)-----  
4. -----(b)(4)-----

## Routine Process Compressed Air Monitoring

Process Compressed Air quality is monitored by routine sampling and testing of the compressed air consists of -----(b)(4)-----  
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**I reviewed SR COA07-OQ-0205-01 Summary Report for the Installation, Operational, and Performance Qualification of the Process Compressed Air System – -----(b)(4)--- and found it to be acceptable. The Process Compressed Air (PCA) system serving -----(b)(4)----- is installed as designed and specified, operates within the established design parameters, and produces compressed air meeting qualification testing requirements. All deviations were successfully resolved. The Installation, Operational, and Performance Qualifications for the PCA system have been satisfactorily completed. I do not have any questions or comments.**

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(b)(4)



**demonstrating that the manufacturing and filling processes produced 13vPnC vaccine meeting its pre-determined quality attributes. Additionally, as detailed in 3.2.P.3.5 Process Validation and/or Evaluation – (b)(4), Validation of Automated Inspection of 13vPnC Syringes at (b)(4), the inspection of the filled syringes by the (b)(4) automated syringe inspection machine met the acceptance criterion for total percent defects, confirming the quality attributes of the syringe presentation. Therefore, the formulation and filling processes were successfully validated.**

#### **Syringe Filling Equipment and Location**

The three process validation lots were filled using the -----(b)(4)----- filler in Syringe Filling -----(b)(4)-----.

#### **Container Closure Components**

The three process validation runs were filled into -----(b)(4)----- syringes with ---(b)(4)-- latex free tip caps and sealed with --(b)(4)--- latex-free stoppers. The syringes include a plastic rigid tip cap (PRTC) overseal.

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**Final Product Testing**

Filled syringes were sampled for testing across each of the three process validation lots. Samples for testing were obtained according to the Production Batch Records and the validation protocol. The testing of the three process validation lots was expanded from the routine release testing for commercial manufacture. -----(b)(4)----- and ---(b)(4)--- testing were performed at----- (b)(4)----- of each lot in addition to standard release testing. ---(b)(4)----- testing was performed for process validation only and will not be a release test. Final product test results are summarized within the submission in Table 1-4. I reviewed the results and found them to be acceptable.